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CROW RESERVATION COMPREHENSIVE PLAN

RESOURCES

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CROW RESERVATION COMPREHENSIVE PLAN

BOOK I

RESOURCES

This document completed as a portion of Comprehensive Planning Project P 45 D 2 under contract with the Montana Department of Planning and Economic Development and the Crow Tribal Advisory Commission of the Crow Tribe of Indians of Montana. The preparation of this document was financed in part through an Urban Planning Grant from the Department of Housing and Urban Development under the provisions of Section 701 of the Housing Act of 1954, as amended

harrison g. fagg & associates
crow tribal advisory commission

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INTRODUCTION

The Crow Reservation consists of 2-1/2 million acres and provide the planner an opportunity to show what can be done within a geographical and political area through comprehensive planning therefor.

The reservation itself could be considered as a state-within-a-state. It has its own form of government, its own boundaries, and its own geographical subdivisions. Likewise, in general climate and topography it ranges from snow-capped mountains to farming valleys. In generalities, the Crow Reservation is an ideal situation to develop and carry out a comprehensive planning program that could serve as a pilot for other reservations, counties, or states to follow.

In compiling this report, every available resource of information about the planning area was researched and analyzed. The records of the Bureau of Indian Affairs, various Montana State agencies, and the Tribal government itself have been analyzed and information gained from these records has been incorporated into seach section of this report. In addition, the Consultant's Survey of Residents was analyzed, tabulated, and made a part of the report sections.

This report is Phase I of a two step planning venture and is, therefore, preliminary in nature and primarily schematic in terms of future design potential. However, detailed information is provided in connection with the statistical background and existing conditions on the reservation.

Phase II of this two phase planning venture will coordinate the planning shown herein and will provide final schemes and final long-range development plans.

The ultimate success of this report will be up to the Tribe and the Crow Tribal Advisory Commission. The opportunities are great, the challenge exists, and the tools for development are available. Action by the appropriate concerns is the only ingredient remaining before total comprehensive development on the Crow Reservation is realized.

HISTORICAL BACKGROUND

The Bighorn Country has been the homeland of the Crow Tribe for nearly 250 years. Their origin is probably in the vicinity of Lake Winnipeg from which they were forced out by hostile Eastern tribes. Whatever location their ancestral home was and why they left it, the Tribe had migrated to the vicinity of Devil's Lake by about 1550.

According to tradition, it was at this location that the medicine men called upon the Great Spirit for guidance. The Great Spirit told the farmers of the Tribe that they should settle down and raise corn. The hunters were given a sacred tobacco seed and given instructions to "go West to the big mountains and plant the seed, and in time they would receive a good land, where they would grow strong and wealthy."

Within the next 50 years the Tribe had migrated to the area of the confluence of the Missouri and Yellowstone Rivers. Here the Tribe separated, the farmers settling in the area and the hunters moving on westward. By 1750 the separation had become complete with the Hidatsa remaining in the Missouri River area and the Absaroga or Crow locating in Eastern Montana and Northern Wyoming.

At the time of the separation, the Crow numbered about 500 persons which grew to a population of nearly 8000 by the mid 1800's. By this time the Crow traveled about in two or three bands. Shortly thereafter the Tribe was heavily decimated by several small pox epidemics.

The Crow and the Hidatsa are of Siouan origin. The Crows refer to themselves as the Absaroga which translated to "Children of the large beaked bird." The name "Crow" is derived from a translation of the French gens des corbeaux from their own name Absaroga or Absaroke.

The first record of white entry into what is now known as the Big Horn Country was made in 1743 when Chevalier de la Verendrye, seeking a route to the Pacific, passed through this area of the Indian territory. The next white men to enter the territory came in 1804 in search of furs and gold. With the exception of these early visitors, and the Clark group of the Lewis and Clark expedition, the area was seen by few white men until the Bozeman Trail was opened in 1864.

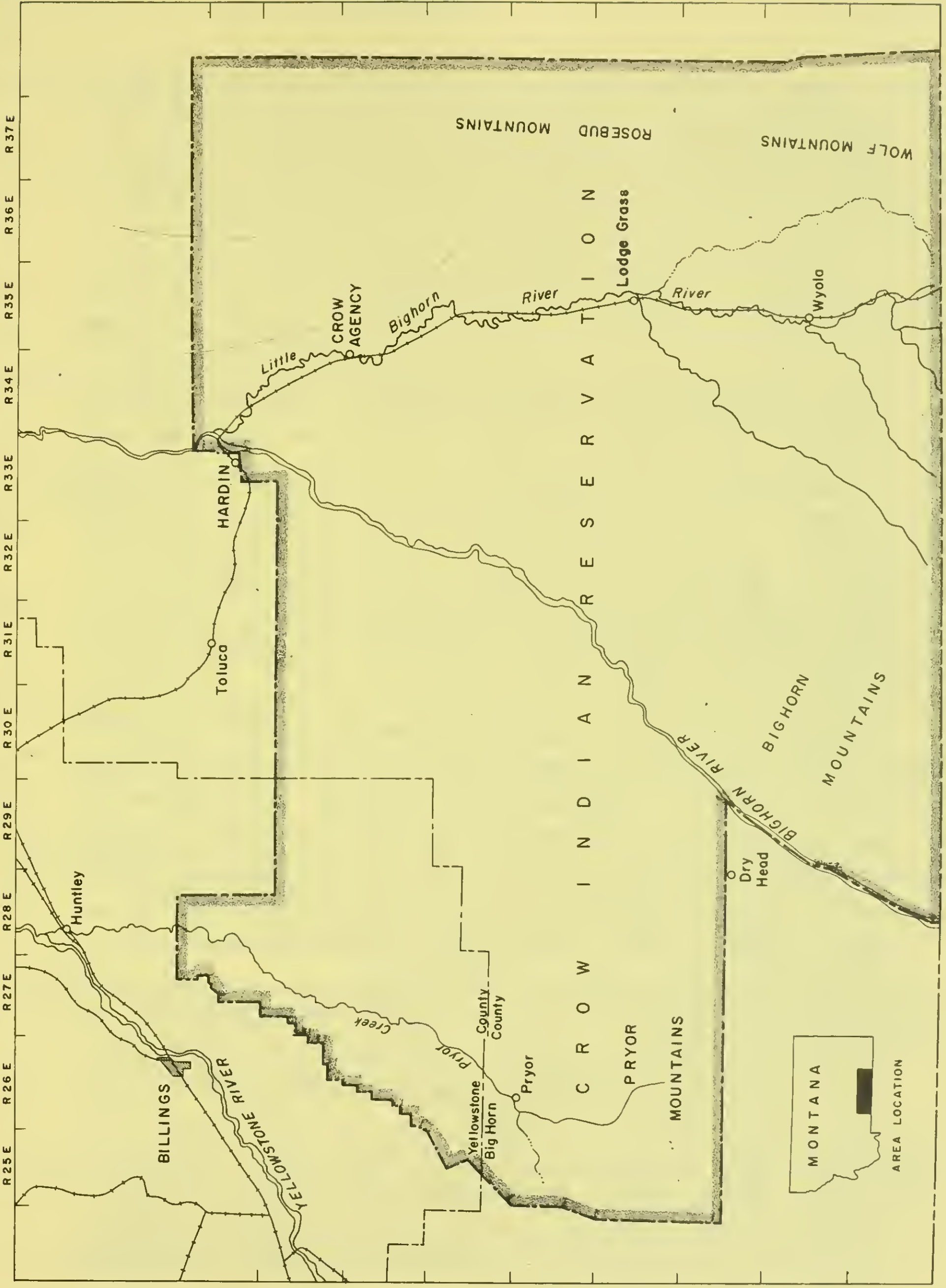
The Crow were at war with other tribes in the area in competition for the prime hunting grounds of the Big Horn when the United States was attempting to isolate the Indians from the white settlers. In 1825 the Crow and the United States signed the Treaty of Friendship and the Tribe joined with the U. S. Army in fighting the other tribes.

The so-called Fort Laramie Treaty of 1851 established the boundaries of the "Indian Country" for several tribes. The Crow, as a result of their cooperation with the United States, were allotted a territory that included 38,531,171 acres in Montana and Northern Wyoming.

The opening of the Bozeman Trail, which was a short-cut between the North Platte and the three forks of the Missouri, sharply increased the number of miners and settlers passing through the area. The trail was blazed right through the heart of Crow country and shortly thereafter three forts were established to protect the emigrants on their way West. Fort C. F. Smith was built at the mouth of the Big Horn Canyon, only a short distance North of the present day Yellowtail Dam.

The Indians resented the intrusion of the ever-lengthening, white-topped wagon trains, and were bitter about the killing and scattering of the buffalo herds. The Government temporarily appeased them by abandoning Fort C. F Smith in 1868 and ordering the miners and settlers to keep out of the area. A new treaty was negotiated with the tribes under which the United States relinquished all claims to lands East of the Big Horns and North of the North Platte. The Government had evidently reconsidered its consession to the Crow under the 1851 Treaty to be overly generous, and the Fort Laramie Treaty of 1868 reduced the Crow reservation to 8,000,409 acres.

Following the signing of the 1868 Treaty, the Sioux were forced out of the Black Hills area and moved north and west to continue their resistance against the white invasion and the stage was set for a crushing climax. In 1875 an expedition under Generals Terry, Crook, and Gibbon was sent to force the Sioux back to their reservations in the Dakotas. The Sioux and the Cheyenne joined forces to resist the U. S. Army in its effort to move the tribes out of the favorable Big Horn country hunting grounds. Plans were made by the U. S. Army for the infantry, led by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R 37 E
ROSEBUD MOUNTAINS
WOLF MOUNTAINS
CROW INDIAN RESERVATION
Lodge Grass
Wyola
Little Bighorn River
CROW AGENCY
HARDIN
Toluca
BIGHORN MOUNTAINS
BIGHORN RIVER
Dry Head
Huntley
BILLINGS
YELLOWSTONE RIVER
Pryor Creek
Yellowstone County
Big Horn County
Pryor
PRYOR MOUNTAINS
MONTANA
AREA LOCATION

General Gibbon, to proceed westward up the Yellowstone to the mouth of the Big Horn River and then to continue southward up the valleys of the Big Horn and Little Big Horn rivers. The cavalry, under General Custer, was to proceed up Rosebud Creek, cross the Divide to the West, and continue to the Little Big Horn Valley. Discovery of the Indian forces in the Little Big Horn Valley prompted Custer to divide his troops into three separate commands and to attack the Indians' combined forces. The overwhelming numbers of the Indians quickly gained the advantage and succeeded in completely annihilating Custer's command and inflicting heavy losses on the troops under Major Reno and Captain Benteen. Although a victory for the Sioux-Cheyenne forces, this was to be their last victory and one from which the repercussions are felt even to the present day. The Indians became aware of the approaching infantry the following day, June 26, 1876, and retreated. Effective action against the "hostiles" was taken by the Government that included establishment of troop garrisons throughout the Indian country. Fort Custer, built at the confluence of the Little Big Horn and Big Horn Rivers in 1877, was one of the new "preventive action" forts.

The Crow Indian Reservation, as established by the 1868 Fort Laramie Treaty, roughly embraced the triangular area between the 107th meridian, the Yellowstone River and the Montana-Wyoming border. Subsequent land cessions to the United States, the States of Montana and Wyoming, and the railroads reduced the total reservation area to approximately 2,100,000 acres of which about 1,500,000 acres are presently in trust ownership.

The following is a brief chronological summary of executive and legislative acts as they relate to the Crow Tribe:

September 1825 - A Treaty for the purpose of perpetuating friendship and to remove all future causes of discussion and dissension with respect to trade and friendship between the United States and the Crow Tribe of Indians (7 Stat 266)

September 17, 1851 - A treaty that set aside certain lands as Indian Territory and allocated large areas to the Sioux, Blackfeet, Crow, and other tribes. This treaty was never fully understood by the Indians due to the imaginary line boundaries or boundaries respected by the whites. (11 Stat 749)

May 7, 1868 - A treaty that reserved certain lands in Montana for the Crow and the Indians relinquished all claims to other lands. Heads of families could select up to 320 acres and other Indians 80 acres and hold the land exclusively as long as they cultivated it. The selections were recorded in the Crow Land Book. Compulsory education of children between 6 and 16 was required. Clothing and other annuities were to be delivered to the Indians each year for a period of thirty years (15 Stat 649-652).

October 20, 1875 - An Executive Order set apart additional lands for the Crow Reservation. This order was revoked by Executive Order of March 8, 1876.

April 11, 1882 - An Act to ratify an agreement with the Crow Indians which provided for sale of part of their reservation to the United States and in return each head of a family was to receive an allotment of 160 acres of farming land and 160 acres of grazing land, and each other Indian 80 acres of farming land and 80 acres of grazing land. Each allotment was to be inalienable and non-taxable for 25 years or longer at the discretion of the President. In addition to annuities provided for in existing treaties, $30,000 was to be appropriated annually for 25 years to be expended under the direction of the President for the benefit of the Crow. (22 Stat 42-43)

July 10, 1882 - An Act to ratify an agreement with the Crow Indians for sale of a portion of their reservation for a railroad. In return for payment of $25,000 to be deposited in the U. S. Treasury to the credit of the Tribe and expended for their benefit (22 Stat 157).

December 7, 1886 - An Executive Order set aside certain lands within the Crow Reservation for Fort Custer, a national cemetary at the Custer battlefield, and for a limestone reservation near Old Fort C. F. Smith. Thirteen Indian families were permitted to remain on the ceded lands and retain their allotments.

February 8, 1887 - An Act (The Dawes Act) provided for the survey and allotment of lands on Indian Reservations for agricultural and grazing purposes with each Indian to select his own allotment for which the Secretary of the Interior would issue a trust patent (25 Stat 388), amended by Act of 1907 (35 Stat 715), and Act of May 26, 1926 (44 Stat 658).

March 3, 1887 - An Act granting to the Rocky Fork and Cooke City Railway Company a right-of-way through part of the Crow Indian Reservation in Montana Territory (24 Stat 545).

June 4, 1888 - An Act granting to the Billings, Clark's Fork and Cooke City Railway Company a right-of-way through the Crow Indian Reservation in Montana Territory (24 Stat 167).

February 12, 1889 - An Act granting to the Big Horn Southern Railroad Company a right-of-way through part of the Crow Indian Reservation in Montana Territory (25 Stat 660). Amended by Act of March 1, 1893 (27 Stat 529).

March 3, 1891 - An Act accepting, ratifying, and confirming an agreement made on December 8, 1890 whereby the Crow Tribe ceded the western portion of the Reservation to the United States in return for payment of $946,000 which was to be expended for irrigation, an irrigation fund, an annuity of $12 in cash to each Indian for the purchase of cattle, equipment, etc. Allottees on the ceded lands were to be permitted to remain on their allotments (26 Stat 1039).

July 13, 1892 - An Act providing that allotments to Crow Indians under the Act of March 3, 1891 were not to jeopardize prior valid mining or homestead claims made by white settlers who settled on reservation lands due to a survey error on the part of the U. S. Government (27 Stat 126).

March 1, 1893 - An Act extending the time for the construction of the Big Horn Southern Railroad through the Crow Indian Reservation for an additional two years and changing the description of the railroad right-of-way (27 Stat 529).

March 1, 1899 - An Act authorizing the President, with the consent of the Crow Tribe, to divert annuities for other purposes and authorizing the use of the funds for irrigation construction (30 Stat 947).

May 31, 1900 - An Act authorizing the President to divert additional annuity funds for irrigation construction (31 Stat 247).

May 27, 1902 - An Act authorizing the Secretary to distribute cattle belonging to the Crow "common herd" among the members of the Tribe and to distribute the Crow Herd Fund on a per capita basis and authorizing the use of Crow funds for the purchase of additional cattle to be distributed with the consent of the Tribe (28 Stat 265).

April 27, 1904 - An Act to ratify an agreement with the Crow Indians to cede a portion of the reservation. Proceeds from the sale of the ceded lands were to be credited to the Crow or expended for the irrigation system, ditches, purchase of cattle, sheep, fencing, school building, a hospital, etc. $100,000 from receipts were to be placed to the credit of the Crow Indians, at 4% interest and the interest expended by the Secretary for maintenance of the irrigation system for 15 years and then the principal and interest expended as Tribe, with the consent of the Secretary, should determine. An additional $50,000 at 4% interest were to be used for hospital maintenance. Per capita payments, at the Secretary's discretion, were to be made. Indians on ceded lands were permitted to remain and receive allotments on their lands or to move to the reduced reservation and receive payment for their former lands and any improvements. This act reduced the reservation to 2,273,803 acres.

Under Article V of the act it was provided : "The water from the streams on that portion of the reservation now sold which is necessary for irrigating land actually cultivated and in use shall be reserved for the Indians now using the lands so long as the Indians remain where they now live." (33 Stat 352-362).

May 8, 1906 - An Act authorizing the Secretary of the Interior, at his discretion when he is satisfied an Indian allottee is competent and capable of managing his affairs, to issue the allottee a fee patent on his lands free from future sale restrictions, encumbrance, and tax restrictions (35 Stat 182).

March 1, 1907 - An Act (General Indian Act) providing for the sale of lands of non-competent Indians under rules set by the Secretary of the Interior, the issuance of a fee patent to the new owner, and providing for the expenditure of sale proceeds for the allottees benefit under the supervision of the Bureau of Indian Affairs (34 Stat 715).

March 3, 1909 - An Act providing that any of the lands withdrawn under the provisions of Section 5 of the April 27, 1904 Act of Congress which were not disposed of within five years would remain subject to disposal under the provisions of the Reclamation Act unless otherwise directed by the Secretary of the Interior (35 Stat 797).

June 25, 1910 - An Act providing for the classification of lands on Indian Reservations for the purpose of allotment and for the allotment of the lands to individual Indians (36 Stat 859).

May 25, 1918 - An Act to authorize the Secretary of the Interior to withdraw $200,000 of tribal funds and to expend the money for making irrigation system improvements in the Big Horn Valley on the Crow Reservation (40 Stat 574).

June 30, 1919 - An Act authorizing the Secretary of the Interior to withdraw $150,000 of tribal funds in the U. S Treasury and to utilize the money to improve irrigation systems (41 Stat 16).

July 19, 1919 - An Act to authorize the Secretary of the Interior to withdraw $150,000 of Crow tribal funds and to expend such amount as may be necessary to maintenance of the Big Horn Valley irrigation system (41 Stat 196).

February 14, 1920 - An Act authorizing expenditure of $100,000 of Crow tribal funds for improvements, maintenance, and operation of the Crow Reservation, including assessments due to the Two Leggins Water Users Association (41 Stat 408).

June 4, 1920 - An Act ("The Crow Act") provided for allotments on the Crow Reservation of 160 acres to the heirs of enrolled Indians who died unallotted between December 31, 1905 and June 4, 1920, and 160 acres to each head of a family who had not received an allotment as such. The remaining unallotted, allotable land was to be allotted so that all tribal members received equal shares of land. Each member was to designate 640 acres as a homestead which was inalienable for 25 years or until the death of the allottee, except that with the approval of the Secretary 320 acres might be sold. Competent allottees were to receive patents in fee, except that the wife was required to join in an application by her husband for a patent in fee for homestead lands, and other Indian trust patents.

Section 2 provides that "No conveyance of land by any Crow Indian shall be authorized or approved by the Secretary of the Interior to any other person, company or corporation who owns at least 640 acres of agricultural or 1,280 acres of grazing land within the present boundaries of the Crow Indian Reservation, nor to any person who, with the land to be acquired by such conveyance, would become the owner of more than 1,280 acres of agricultural or 1,920 acres of grazing land within said reservation." Section 2 also provides that such conveyance will be void and the grantee guilty of a misdemeanor punishable by a fine of not more than $5,000 and/or imprisonment for not more than six months.

Certain agency and other lands were to be reserved and the Secretary was authorized to reserve townsites. Mineral deposits were reserved for the benefit of the tribe and were subject to lease for 10-year periods for 50 years and then were to become the property of the allottees. Provision was made for payment of irrigation charges on allotments and certain school lands were to be granted to the State of Montana provided Indian children were admitted to State schools, and the Tribe was to be compensated for the lands granted. The provisions of the Act of April 27, 1904, establishing trust funds, were repealed and all trust funds were consolidated in one trust fund, at 4% interest. From this consolidated fund, certain amounts were reserved for expenses of the agency, an agency boarding school, the hospital and a revolving fund of $50,000 for the purchase of seed, farm impelments, etc., through loans to tribal members until June 30, 1965. On request of the tribal council, balances in the consolidated 4% fund might be added to the revolving fund. Other balances in the fund were to be distributed per capita (41 Stat 751).

Amended by Act of March 4, 1925, Public Law 625 (43 Stat 1301)
Amended by Act of April 14, 1926, Public Law 299 (44 Stat 251)
Amended by Act of March 3, 1927, Public Law 728 (44 Stat 1365)
Amended by Act of March 3, 1931, Public Law 801 (46 Stat 1495)
Amended by Act of July 1, 1932, Public Law 58

Amended by Act of June 20, 1936, Public Law 718

Amended by Act of June 8, 1940, Public Law 569 (54 Stat 252)

Amended by Act of June 1, 1944, Public Law 324 (56 Stat 266)

Amended by Act of June 25, 1946, Public Law 441

Amended by Act of March 15, 1948, Public Law 444 (62 Stat 80)

Amended by Act of September 8, 1949, Public Law 303 (63 Stat 695)

Amended by Act of June 4, 1953, Public Law 49 (67 Stat 42)

Amended by Act of September 15, 1959 Stat

March 3, 1921 - An Act authorizing expenditure of $200,000 for improvements, maintenance, and operation, including maintenance on Two Leggins Canal and construction of a diversion dam on the Big Horn River (41 Stat 1225)

May 24, 1922 - An Act authorizing expenditure of $125,000 for improvements, maintenance, and operation of irrigation systems on the Crow Reservation including the Two Leggins Canal (42 Stat 559).

June 10, 1922 - An Act providing for acquisition of additional water rights for Indian allotments irrigable under the Two Leggins Canal (42 Stat 625)

January 24, 1924 - An Act appropriating $175,000 from Treasury funds for improvements, maintenance, and operation of reservation irrigation projects, including Two Leggins and Bozeman Trail Canals.

June 2, 1924 - An Act granting citizenship to all Indians born within the territorial limits of the United States and guaranteeing that citizenship shall not affect the rights of any Indian or tribal or other property.

June 5, 1924 - An Act appropriating $150,000 for imrpovements, maintenance, and operation of the Two Leggins, Bozeman Trail, and other canal irrigation projects of the Crow Reservation (43 Stat 390).

March 3, 1925 - An Act appropriating $16,000 for maintenance of projects on the Crow Reservation (44 Stat 1141).

March 4, 1925 - An Act extending the time for repayment of loans from the tribal revolving credit fund to June 30, 1935 (43 Stat 1301).

April 14, 1926 - An Act authorizing payment of tuition for Crow Indian children attending Montana State public schools (44 Stat 251).

May 10, 1926 - An Act appropriating $5000 for maintenance and operation of various projects on the Crow Reservation (44 Stat 458).

May 19, 1926 - An Act providing for allotment of lands in severalty to Crow children, so long as tribal lands are available for allotment (44 Stat 566).

Amended May 2, 1928 (44 Stat 482).

May 26, 1926 - An Act amending the Act of June 4, 1920 to permit the lease of allotments for farming and grazing purposes for periods of up to five years except for irrigable lands under the Big Horn Canal, which might be leased for ten years (44 Stat 568).

Amended June 25, 1946 (60 Stat 308)

Amended March 15, 1948 (62 Stat 80)

July 3, 1926 - An Act conferring jurisdiction on the Court of Claims to adjudicate claims of the Crow Indians under the Treaty of May 7, 1868 with the proceeds of any judgments to be deposited in the Treasury of the United States to the credit of the Indians so entitled, at 4% interest (44 Stat 807)

Amended August 15, 1935 (44 Stat 655).

January 12, 1927 - An Act appropriating $1000 for maintenance and operation of various projects on the Crow Reservation (44 Stat 934).

March 3, 1927 - An Act amending the Act of June 4, 1920 to add that leases of Indian-allotted lands be limited to five years in term (44 Stat

May 3, 1927 - An Act establishing the period in which leases for grazing and farming lands might be negotiated prior to the expiration of lease contracts on trust lands (44 Stat 1365).

March 7, 1928 - An Act for maintenance and operation of the irrigation systems on the Crow Reservation including maintenance assessments payable to the Two Leggins Water Users Association and Bozeman Trail Ditch Company, that are properly assessable against lands allotted to the Indians located on lands irrigated by the projects (45 Stat 200).

April 14, 1928 - An Act appropriating $7,500 of tribal funds for construction of the Hardin to St. Xavier road on the condition that the State of Montana appropriate an additional $15,000 to pay the remainder of construction costs (45 Stat 429).

March 2, 1929 - An Act to authorize the appropriation of $5000 from tribal funds for expenses of tribal councils and delegations to Washington, D. C. when authorized by the Secretary of the Interior (45 Stat 1496).

April 15, 1930 - An Act authorizing an appropriation of $3045 to compensate Crow Indians for lands taken from certain tribal and allotted lands for the Custer Battlefield National Cemetary (46 Stat 168).

March 3, 1931 - An Act effectuating the power of the Secretary of the Interior to change from incompetent to competent any classifications made under the 1920 Act as provided under Section 12 (46 Stat 1495).

March 3, 1931 - An Act requiring a court decree or a written adoption approved and recorded by the superintendent of the Crow Indian Agency for recognition of an adopted heir of a deceased Crow Indian (46 Stat 1494).

June 30, 1932 - An Act authorizing the Secretary of the Interior to expend $5000 from tribal funds for the expenses of tribal councils and delegations to Washington, D. C. (47 Stat 420).

July 1, 1932 - An Act allowing the Secretary of the Interior to place lands in trust status which are purchased with money received from the sale of an allottees land to any other person or coproration or condemned or sold to a state, county or local government for public improvements (47 Stat 424).

July 1, 1932 - An Act deferring the collection of construction costs against Indian owned lands for government irrigation projects ("Leavitt Act").

June 26, 1934 - An Act authorizing the appropriation of $600 of Crow tribal funds to retain a qualified irrigation engineer to investigate, report, and testify in the matter of claims regarding irrigation project construction on the Crow Reservation as pending in the Court of Claims (48 Stat 1437).

April 5, 1935 - An Executive Order extending the trust period or restrictions on alienation of lands on the Crow Reservation until 1945 (ExO. 7001).

May 15, 1935 - An Act extending the repayment time for loans from the Tribal Revolving Credit Fund to June 30, 1945.

Amended June 1, 1944 (56 Stat 266)

August 12, 1935 - An Act providing for review by the United States Supreme Court any claims held by the Crow Tribe or any other tribe against the United States Government provided the case has been heard in the United States Court of Claims (49 Stat 429).

June 30, 1936 - An Act authorizing the use of tribal funds for per capita payments or such other purposes as may be designated by the council and approved by the Secretary (49 Stat 1543).

August 31, 1937 - An Act eliminating certain lands (Hardin townsite) from the Crow Reservation (50 Stat 884).

April 11, 1940 - An Act re-imposing trust status on allotted lands in the Crow Reservation upon which the trust period had expired July 14, 1931, or at any other time prior to approval of this act and for which fee patents had not been issued and extending the trust period to May 23, 1940 with further extensions to be made at the discretion of the Secretary of the Interior (54 Stat 106).

June 8, 1940 - An Act to amend the Act of June 4, 1920 to permit the Secretary of the Interior, under certain circumstances, to approve sales of allotted and inherited lands to members of the Crow Tribe without regard to acreage limitations, and authorizing the exchange or sale of allotted and inherited lands with retention of mineral rights (54 Stat 252).

June 11, 1944 - An Act extending the time for repayment of loans from the Tribal Revolving Credit Fund to June 30, 1965 (56 Stat 266).

June 25, 1946 - An Act establishing the maximum lease period on irrigable lands at ten years and all other land classifications at five years (60 Stat 333).

June 28, 1946 - An Act requiring the consent of the Crow Tribe prior to any further irrigation construction work on the Crow Reservation (60 Stat 336).

March 15, 1948 - An Act requiring that leases of all lands on the Crow Reservation must be filed and recorded at Crow Agency and establishing that competent Crows are responsible for insuring compliance of the terms of their leases and requiring the approval of the Superintendent on all leases for trust land owned by more than five competent heirs (62 Stat 80).

July 1, 1948 - An Act authorizing the Secretary of the Interior, upon request of the Crow Tribal Council, to sell inherited Crow lands to the United States in trust for the tribe and to sell such trust lands of the Crow Tribe with preference to be given to the individual heirs of the decreased allottees with the largest interests (62 Stat 1215).

February 5, 1949 - An Act authorizing the Secretary of the Interior to grant right-of-ways across trust land under the following conditions: 1. With the approval of the individual landowner; 2. with the consent of the majority of owners where more than one owner has an interest in the land in question; and 3. where owners are unknown or too numerous to allow practical cain of consent of the majority. The Secretary may grant the right-of-way without consent and compensate the fractionated landowners as he determines to be just.

August 17, 1949 - An Act authorizing taxation of all Indian restricted land and land purchased with restricted Crow Indian funds within Lodge Grass, Montana, for municipal water supply and sewer system assessments (63 Stat 613).

September 8, 1949 - An Act providing that children of competent Crow Indians should automatically become competent upon attaining majority and authorizing the Secretary of the Interior to classify as competent or incompetent all adult unenrolled Crow Indians and to add them to the applicable role and to reclassify incompetent to competent (63 Stat 695).

October 25, 1949 - An Act transferring title to buffalo on the Crow Indian Reservation to the United States in trust for the Crow Indian Tribe and authorizing the Secretary of the Interior to grant unrestricted title to any or all such buffalo (63 Stat 904).

June 4, 1953 - An Act providing fee patents may be issued and land sold on all homestead or agricultural land upon written application by the Indian owners, subject to approval by the Secretary of the Interior (Stat   ).

August 15, 1953 An Act repealing the prohibition of liquor on Indian reservations to the extent that the use of liquor is in conformity with an ordinance duly adopted by the Tribe which has been certified by the Secretary of the Interior and published in the Federal Register (67 Stat 587).

May 19, 1958 - An Act providing for compensation to the Crow Tribe for ceded lands within the Huntley Reclamation Project (72 Stat 121).

July 18, 1958 - An Act appropriating to the Crow Tribe $2,500,000 for 5,677.94 acres to be contained in the Yellowtail Dam and Big Horn Reservoir and reserving to the Crow Tribe all mineral rights and the right to hunt and fish without license to tribal members within the right-of-way area (Public Law 85-523).

September 15, 1949 - An Act amending Section 6 of the Act of June 4, 1920 to pass all mineral rights to the allottee or his heir in 1970 regardless of any previous conveyance of land or mineral rights but subject to any mineral leases made by the tribe that extend past 1970 (72 Stat 361).

The 1920 "Crow Act" as amended in 1926, 1948 and 1949 provide for the designation of individual tribal members as "competent" Indians and thus are the instruments whereby the Crow have gained more authority for leasing their own land, without supervision, than any other tribe. However, the acts have as much negative effect as positive since many tribal members were not, and are not, sufficiently educated in managerial skills as the authors probably envisioned. The tribal members control over one-and-one-half million acres of land of which about one-fourth million acres are held in trust for the collective enrolled membership. The great majority of this vast real estate holding is under lease to non Indian farmers and ranchers. Less than 15% of the total tribal holdings are operated by Indians and only a very small percentage of this land is utilized as either dry land or irrigated farmland. As a result, many

Crow families are substantially dependent upon leases for a large percentage of their annual income. This situation has provided a lack of any prestige value usually associated with the indicators of private wealth such as property, personal gain, and social stature. In other words, the lease income has retarded any incentive to utilize the land holdings to the maximum benefit of the owner.

The Crow in the relatively small group that have developed their own resources are for a large part resented by the tribal members who have not. Those who have attained good managerial ability are in many cases able to negotiate several times the income derived through "office" leases for the acreage they do not need for their own use. The select few in this group own the great majority of the Indian-owned livestock on the reservation.

A relatively new program of the Bureau of Indian Affairs hopes to solve the question of low lease terms, and the poor management of the Indian operated agricultural enterprises. Through instruction of animal husbandry, basic farm economics, stock production, and general household budgeting, the Indian operators of the farms and ranches are becoming more and more adept in their enterprises.

The Crow Tribe received a net judgment award of $9,238,500 from the Indian Claims Commission in 1961. The award was for additional compensation for more than 30.5 million acres ceded to the United States in 1868. The Tribe programmed the expenditure of the money as follows:

1. $100 per capita payments to enrolled members as of February 1962 and $50 in March; $1000 per person for permanent family, social, and economic development. Total expenditure in this manner was about $4,350,000.
2. $1,000,000 for a land purchase program
3. $275,000 for a credit program
4. $1,000,000 to assist tribal members in regaining control of leased land.
5. $1,000,000 for tribal economic development
6. $200,000 for education

7. $100,000 for on-reservation law and order activity
8. $120,000 for construction of a new Tribal headquarters and multipurpose building

Under the Crow Family Plan as established by the Tribe and administered by the Bureau of Indian Affairs, the distribution of the $1000 to each enrolled tribal member could be used for housing, household furnishings, agricultural enterprises, small business investment, education, training, savings, medical and dental services, etc. The social and economic benefits from this program have had an important impact on the Crow people. It has helped many families raise their living standards to a level which could not have been attained without the benefits of the Crow Family Plan program.

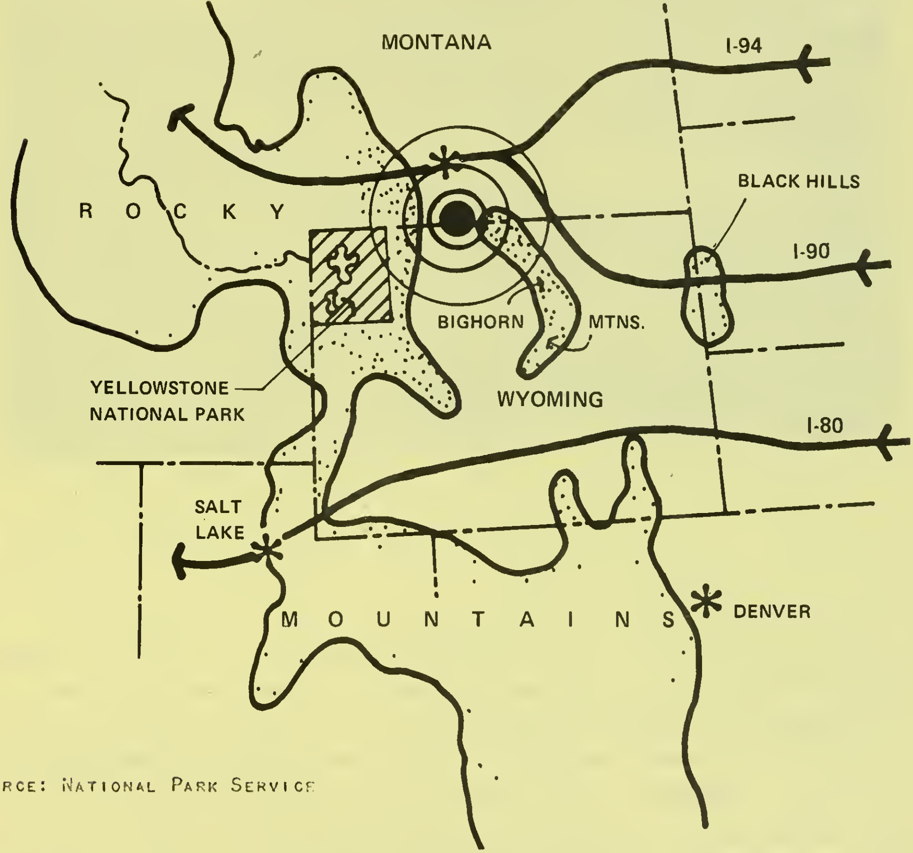
The Court of Claims awarded a second judgment in 1964 for lands taken for Yellowtail Dam and Big Horn Lake. The approximate $2,000,000 has been allocated by the Tribe in a manner similar to the first award. In addition discovery and development of minerals, including oil, uranium, bentonite, and coal, have further enhanced the future tribal prospects.

The Crow Tribe has been designated as the master concessionaire for the Big Horn National Recreation Area by the National Park Service. It is anticipated that the strategic location of the area, about midway between the Black Hills and Yellowstone Park, will accelerate its importance as a recreation area. When development of the area is complete, the Tribe will have a favorable complement to their newly constructed motel-heritage park complex near the Custer National Monument at Crow Agency.

The development of the Crow economy through programs in industrial and recreational development, land purchase, multiple land use, mineral explorations, and the importance placed on a high school education and post-graduate training, provide the Tribe with an extremely bright future.

PHYSIOGRAPHY AND ECOLOGY

The Crow Indian Reservation lies almost entirely within Big Horn County, Montana, with the exception of the northwestern end which falls in Yellowstone County. The reservation embraces the majority of the more recently formed alluvial lands, or the valley proper of the Big Horn, Little Big Horn, and Pryor Rivers. In addition to alluvial lands, the area includes rough broken lands, rocky escarpments, and smooth high benches that border the valleys.



Source: National Park Service

location

Hardin, the county seat of Big Horn County, is adjacent to the northern boundary. It is about 50 miles north of the Montana-Wyoming State Line and about 45 miles east of Billings, the principal city of Montana.

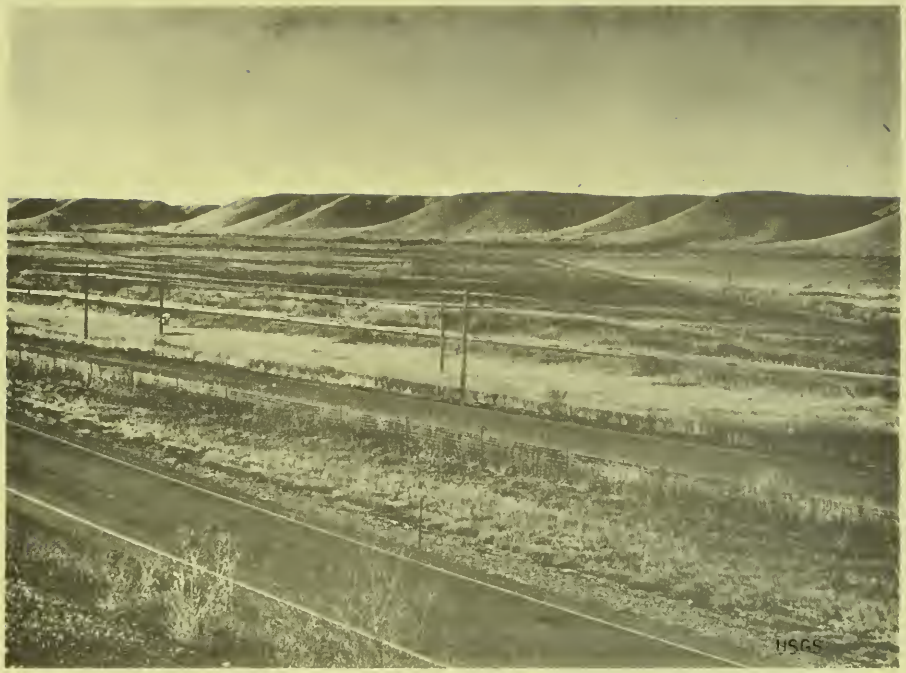
The southern boundary of the reservation is the Montana-Wyoming border which passes through the Big Horn Mountains, a spur of the Rocky Mountains. The Big Horns rise sharply to elevations of more than 9,000 feet.

The reservation is bounded on the east by a rough hilly area known as the Wolf and Rosebud Mountains and the Pine Ridge plateau which lies north of the Rosebud Mountains. The maximum altitude of the Pine Ridge plateau is about 4,000 feet. The land slopes gently to the north and northeast.

The Rosebud Mountains and Wolf Mountains form the divide between the Big Horn River drainage basin and that of the Tongue River. An exceedingly rugged range of pine covered hills, these mountains rise almost on the Montana-Wyoming border and extend on north into Treasure County. The range is somewhat insignificant when compared to the lofty Big Horn Mountains, but, when compared with other features in this plains area, they are considerable elevations that attain a maximum altitude of some 5,500 feet above sea level. They form a somewhat formidable east-west barrier to communications since, with the exception of U.S. Highway 212, only a few jeep trails exist as a means of crossing them. The gentle slopes are on the Tongue River side and the steeper inclines face the west.

The Rosebuds are, in reality, a western scarp of the hard sandy beds of the Land and Fort Union formations. These are the youngest formations of the great syncline between the Big Horn and Black Hills anticlines. The rocks consist primarily of alternating layers of shale, sandstone, and coal beds. The softer shales form gentle slopes that end abruptly at the steep cliffs of sandstone which generally border the valleys. This condition has been caused by the greater resistance of the harder sandstone to erosion, as well as the ever present clinker beds which are also resistant. The clinker beds, which are usually red due to the ferric oxide content, are the result of the partial fusing of the sandstone and shale by the burning of coal along frequent outcrops. Not only are the clinker beds, which are known locally as slag and lava, resistant to weathering, but they constitute one of the prominent features of the mountain landscape. They are particularly spectacular from the air where the bright red bands constitute a sharp contrast to the drab shales and yellow sandstones and the pine trees that occur on the slopes.

Considerable quantities of low sulphur coal are present in the underlying beds, but little has been developed on the reservation due to the well developed



THE TERRACES IN THE BACKGROUND, LOCATED JUST NORTH OF CROW AGENCY, ARE A COMMON PHYSIOGRAPHIC FEATURE OF THE AREA.

MINES AT COLSTRIP TO THE NORTH AND SHERIDAN TO THE SOUTH. EXPLORATION OF THE FIELD AND A GOOD TRADE IN COAL LEASES HAS DEVELOPED IN THE PAST FEW YEARS DUE TO ANTI-POLLUTION CONTROLS THAT MAKE THE LOW SULPHUR COAL PREFERABLE TO THE MUCH HARDER ANTHRACITE VARIETIES OF THE APPALACHIA REGION.

THE ROSEBUDS SUPPORT STANDS OF BOTH LODGEPOLE AND PONDEROSA PINE, BUT THE SMALL, WIDELY SPACED TREES ARE NOT OF TOP COMMERCIAL QUALITY. THIS DOES NOT PREVENT LIMITED LOGGING OPERATIONS AS THE LACK OF CONSTRUCTION LUMBER IN THE AREA HAS INCREASED THEIR RELATIVE VALUE. MOST OF THE DRY-LAND FARMS STARTED IN THE HOMESTEAD DAYS HAVE SINCE BEEN ABANDONED IN FAVOR OF STOCK GRAZING. THE GRASS IS EXCELLENT AND THE SANDSTONE RIMROCKS AND STANDS OF TIMBER OFFER GOOD SHELTER DURING PERIODS OF SEVERE WEATHER.

Similar to the Rosebud-Wolf Mountains, the Big Horn Mountains and the Pryor Mountains are structurally a unit. However, in this case the dividing line is much more prominent in the form of the now water-filled Big Horn Canyon. Their combined area is about 500 square miles or roughly one-fifth of the total reservation land area.

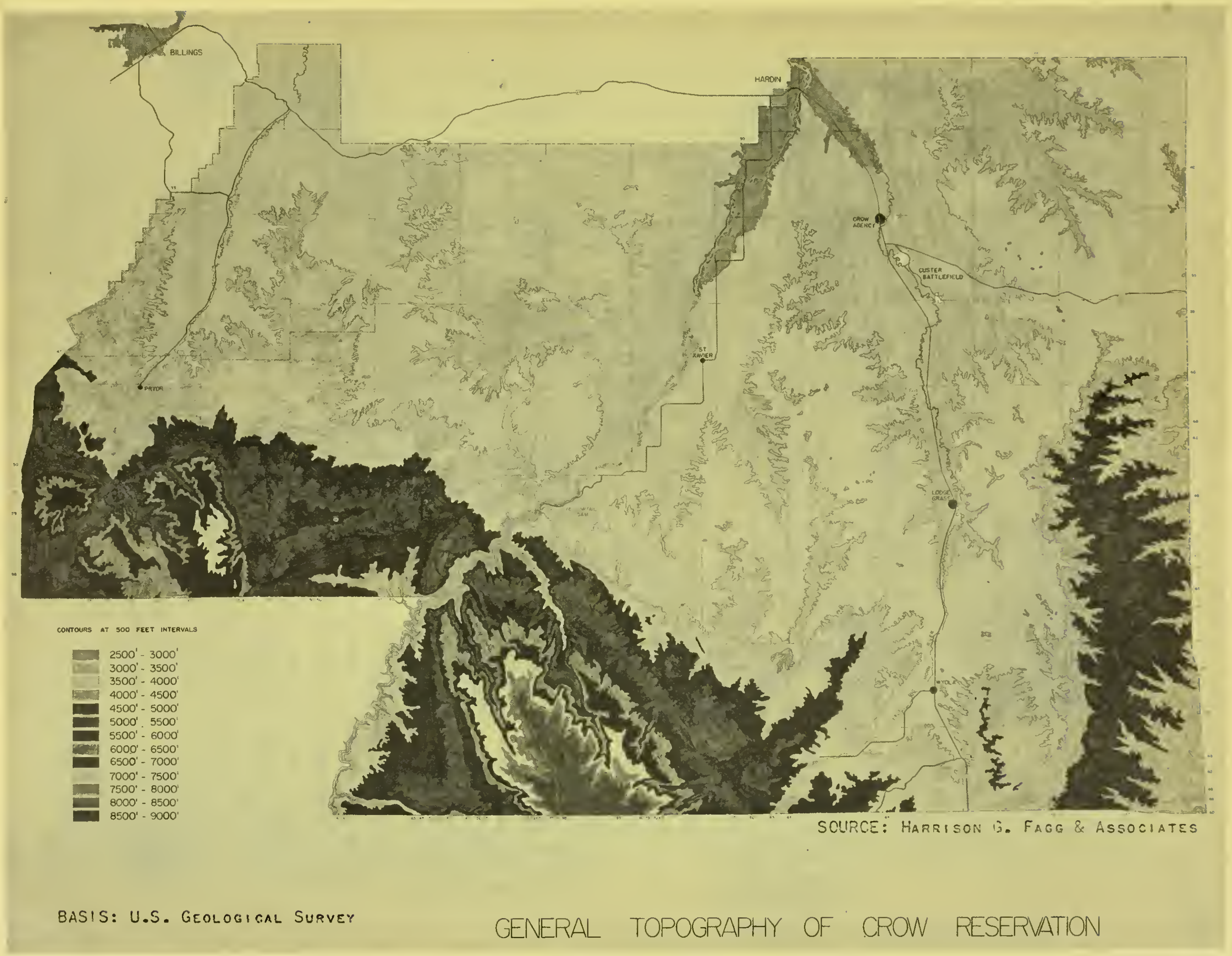
The loftiest peaks of the Big Horns rise to over 13,000 feet in Wyoming which has the greater share of the range. The Montana portion does not have the rugged grandeur of those south of the border and the altitude just slightly exceeds 9,250 feet and the mountains are more gentle and rounded until reaching the lower elevations where steep-walled canyons have been furrowed from streams now far below.

The Pryor Mountains are about three-fifths located on the reservation with the remainder in Carbon County, Montana. The highest peak reaches 8,800 feet but most tops are in the area of 7,500 feet. The Pryors are much more rounded than their neighbors, the Big Horns, and lack the sharp peaks associated with that range.

Four canyons of the Big Horn-Pryor range deserve special mention as they are exceptional in appearance:

Big Horn Canyon is the largest of the four and is over 1,000 feet deep. Shales and limestones lie at the bottom of the canyon and are surmounted by massive limestone cliffs which are, on occasion, capped by sandstone. Prior to completion of the Yellowtail Dam and subsequent rise of the Big Horn level to some 3,600 feet, the river completely filled the bottom of the canyon, leaving not even sufficient space at either side of the river for so much as a footpath. The canyon depth is but a fraction of the total amount that the river cut below the general surface of the uplands. An increasing number of tourists visit the canyon and lake each year to view the deep notch and its spectacular lake.

Canyon Creek is a tributary of the Big Horn and, in comparison to the Big Horn, is a small, inconspicuous stream. However, it has performed a monumental task in carving a relatively narrow canyon that ranges from 1,200 to 1,500 feet deep. Black Canyon is deeper and narrower than the Big Horn Canyon and probably derived its name from the impression of darkness and mystery as viewers peered from



SOURCE: HARRISON G. FAGG & ASSOCIATES

BASIS: U.S. GEOLOGICAL SURVEY

GENERAL TOPOGRAPHY OF CROW RESERVATION

the tops of its walls. Now partially filled with the waters of the Big Horn Lake, the canyon has retained its majestic splendor and the casual sightseer may still view the sculpture of Canyon Creek in the upper reaches of the canyon.

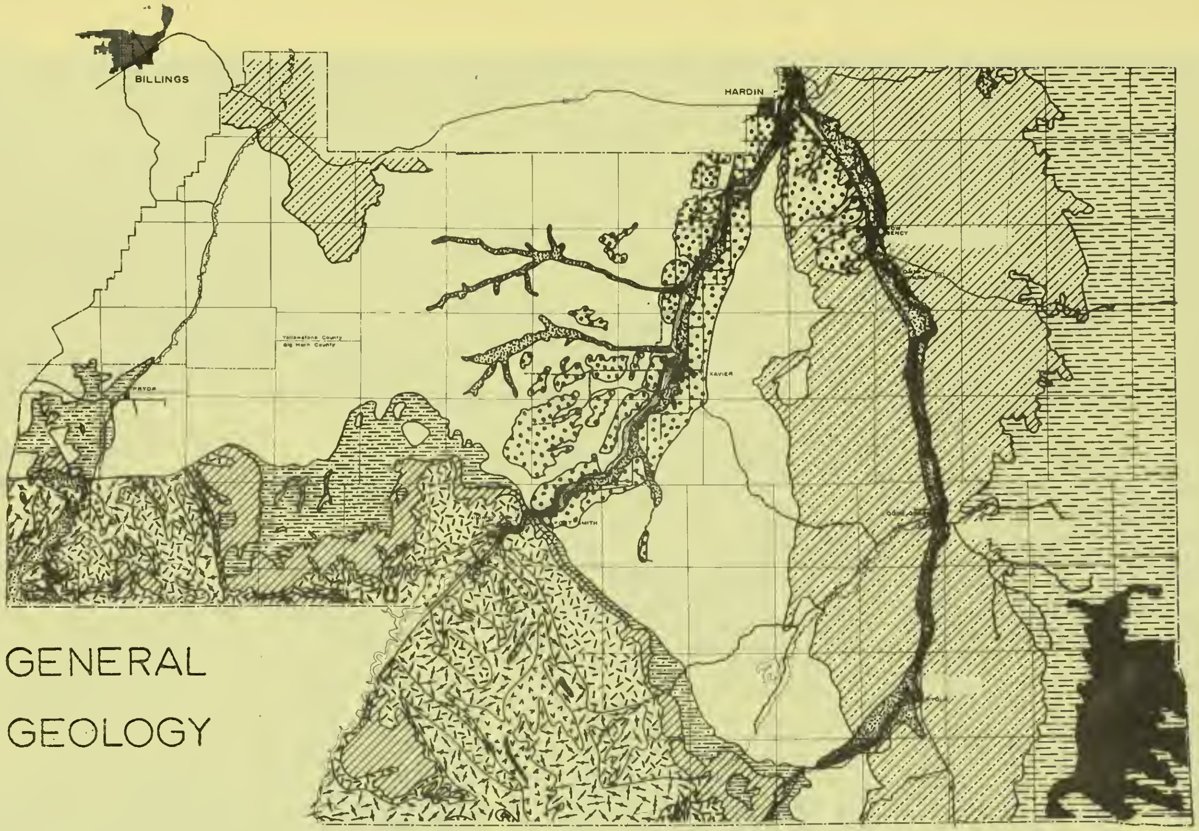
During recent years the Canyon of the Little Big Horn has become popular with the fishermen and campers. Access to the brilliantly colored walls that rise to heights of 1,200 to 2,000 feet above the river level is much easier than in the first two canyons mentioned. The more picturesque portions are located in Wyoming, but the visitor to the length on the Crow Reservation will not be disappointed.

The Pryor Mountains have also been cut by steep-walled canyons. Although the stream that cut the deep and relatively wide "Pryor Gap" has vanished; mute testimony to its effectiveness is presented in the only low-grade pass through these mountains. This canyon, formerly used by a railroad, has castellated walls that rise over 1,000 feet from the valley floor. The road from Pryor to Warren has not been maintained for general traffic, but the dedicated outooorsman or tourist will find it passable.

Selected peaks rise from the Big Horn-Pryor uplands to as much as 3,000 feet, but for the most part the uplands are characterized by smoothly rolling forest lands and open meadows that are used during the summer months as pasture for large cattle herds. The traveler approaching the mountains is impressed by the abrupt changes in altitude that often occur within just a few yards. Long narrow "hogback" ridges that parallel the mountains mark the transition from the plains. Formed by tilted hard layers, the ridges are layers of rock that resisted erosion as the softer layers above and below were removed. Although commonly only a few hundred feet high, the hogbacks are a striking feature of the landscape. Structurally they are a part of the mountains.

The largest part of the Crow Reservation is comprised of generally moderate relief plains. In the northern portion the relief seldom reaches 500 feet but increases are noted as the mountainous areas are approached where the general relief may be 1000 feet or more. The beds of rock that occur throughout the plains area are almost exclusively of the sandstone and shale groups. In most locations the beds appear horizontal although

GENERAL GEOLOGY



LEGEND

QUATERNARY
▨ Recent alluvium
▨ Pleistocene terrace deposits

TERTIARY
▨ Eocene Wasatch Formation
▨ Paleocene Fort Union Formation

CRETACEOUS
▨ Montana Group
☐ Colorado Group

JURASSIC
▨ Undifferentiated

TRIASSIC and PERMIAN
▨ Undifferentiated

PENNSYLVANIAN
▨ Undifferentiated

MISSISSIPPIAN
▨ Undifferentiated

DEVONIAN, ORDOVICIAN, and CAMBRIAN
▨ Undifferentiated

PRECAMBRIAN
▨ Pre-Belt gneiss

SOURCE: U.S. GEOLOGICAL SURVEY

they normally have gentle northerly dips that are interrupted by minor folds and faults on occasion. The rock underlayment is the primary factor in determining the topography. Where thick shales occur, broad gently rolling flats, separated by sandstone rimrocks are the rule. This is caused by the more rapid deterioration of the shale as compared to the more weather resistant sandstones. In the selected areas where thin, alternating layers of sandstone and shale occur, the country is rugged steep slopes that are often covered by scrub pines common to the region. Steep sandstone slopes occur in the areas where the rock is less weather resistant as opposed to the cliffs resulting from the harder varieties.

The sedimentary origin of the plains ceases with the occurence of Fort Union and Wasatch Formations which are the youngest beds that crop out of the plains over substantial areas. Deposits of gravel, probably of Tertiary origin, are found in much of these uplands and alluvium occurs in the valleys of the larger drainages. Throughout most of the Reservation the broad, nearly flat surfaces are the result of erosion of overlayment of soft rock beds on the flat harder rocks rather than the more usual widespread base leveling.

The plains are broken up by the numerous branches of the Big Horn, Little Big Horn, and Pryor drainages. These streams generally have cut narrower and deeper valleys in the hard rock than in the shales. However, sharp valleys and box canyons are not unusual occurrences in the predominately shale areas, probably due to the semi-arid nature of the climate.

In synopsis, the surface features of the reservation are nearly level bottom lands and low benches or terraces adjacent to the major drainages. Above these are a series of higher benches at different levels which represent the progressive stages of entrenchment and temporary base leveling of the present streams. West of the Big Horn River the benches are at five distinct levels and are mantled with gravelly mountain outwash, valley filling material, and old alluvium which is underlain at varying depths by shale, limestone, and sandstone bedrock. The upper edges of the terraces merge with erosional surfaces, or pediments developed on the bedrock formations of the upland. The terraces and pediments are crossed in places by fairly wide drainageways of intermittent tributaries of the major rivers. Several of these intermittent streams have built alluvial fans out onto the lower benches.

Outcrops of Madison Limestone, such as this one on Lodge Grass Creek, are common in the Big Horn and Pryor Mountains.

CLIMATE:

The climate of the Crow Indian Reservation is continental and semi-arid, and characterized by abundant sunshine, low relative humidity, moderate wind movement, light precipitation, and wide daily and seasonal temperature variations. The winters are moderately cold with cold waves occurring every winter, but varying somewhat in intensity. As a general rule, the cold waves are not prolonged and are frequently broken by chinook winds that forecast comparatively long periods of mild weather. During the summer months temperatures frequently reach into the 90's and occasionally over 100 degrees. Although hot, the weather is not oppressive because of the low humidity. Summer temperatures are tempered by cool nights. January is normally the coldest and July the hottest month.

Weather conditions have been recorded at Hardin, Crow Agency, Wyola, Lodge Grass, St. Xavier, Pryor, and during the last five years, at the Yellowtail damsite. With the exception of Hardin and Crow Agency information is limited to that supplied by unmanned recording equipment. Records of precipitation at reservation area stations, some of which are sketchy or incomplete, indicate that the annual precipitation generally increases southward from Hardin, and westward from Busby, which is about 24 miles east of Crow Agency. May and June are the months of highest rainfall. Wide variations in monthly precipitation at the various stations indicate that localized storms produce the great majority. From very light local showers to ones of cloudburst proportions are characteristic of the late spring and summer precipitation. The normal annual precipitation is 14.83 inches at Wyola, based on 39 years of record; 15.21 inches at Crow Agency, based on 89 years of record; and 12.19 inches at Hardin, based on 31 recording years. Crop growth is generally favorable due to the distribution of rainfall. However, dryland farming becomes an uncertain venture due to the wide deviations from the normal. Deviations can be as much as 30% over or under the normal in succeeding years. Through curves developed by the U. S. Weather Bureau, the frequency that precipitation deviates from the normal may be estimated. It may be deduced from these curves that slightly over 26% of the years of record at Crow Agency had a two inch or greater departure below the normal. In other words about 23 of the 89 years of record had less than 13 inches of precipitation.

Wind direction and speed appear to vary considerably throughout the reservation although in a general sense, westerly winds could be said to prevail. Crow Agency's winds usually arrive from the West or Northwest but easterly winds are not uncommon. Hardin breezes are generally westerly or northwesterly. At Pryor, winds originate out of the Southwest, West and Northwest. Northerly, northwesterly and South winds are recorded at Yellowtail.

Killing frosts have occurred at all stations recording for over ten years as early as August and as late as June. The average date of killing frost is May 12 at Crow Agency and May 23 at Pryor. The frost-free growing season is generally about 125 days. Pryor's frost free season averages 123 days while Crow Agency boasts the longest with 134 days.

In terms of a growing season, farmers have generally found it to be of sufficient length for most small grains, sugar beets, alfalfa, and hay crops. An early frost is usually the most damaging to corn crops. Dry farming of small grains methods have proved to be often unsuccessful over a prolonged period of years due to the commonly low and often uncertain precipitation. As a result, most farmers keep a percentage of their land under irrigation or a semi-irrigated state. Crop damage due to hail occurs each season although it is normally limited. However, severe damage in restricted areas occurs on occasion. Crop losses due to flooding from heavy snow melt and unusually heavy spring rain have decreased substantially since the construction of the Yellowtail Dam. Crop damage from other conditions such as wind, sleet, and snow are uncommon.

VEGETATION:

The vegetation of the Crow Reservation is typical of the upper Great Plains area. Short grasses are dominate and the primary varieties found include western wheatgrass and blue gramma which are most abundant on the loamy soils. Niggerwool and western needlegrass are the types common to the more sandy uplands. Where shallow soil bases have become overgrazed and upland farms abandoned matchweed predominates. Black sage, western wheatgrass, meadow barley, sunflower, cockleburs, gumweed, and foxtail are characteristic of the heavy soils. Saline soil supports saltgrass, greasewood, atriplex, and suaeda.

Scattered stands of western yellow pine occur in the rough uplands. On the slopes of mountainous areas are partial to dense stands of lodgepole pine, Douglas fir, Whitebark pine, and limber pine. Occasional stands of aspen also occur. Grasses under the timbered stands usually consist of oniongrass and oatgrass. Forbs including the daisy, geranium and quite a variety of woody plants such as juniper and sagebrush also occur. Along the streambeds, cottonwood, chokecherries, buckbush, buffaloberry and willows are frequently found.

SOILS:

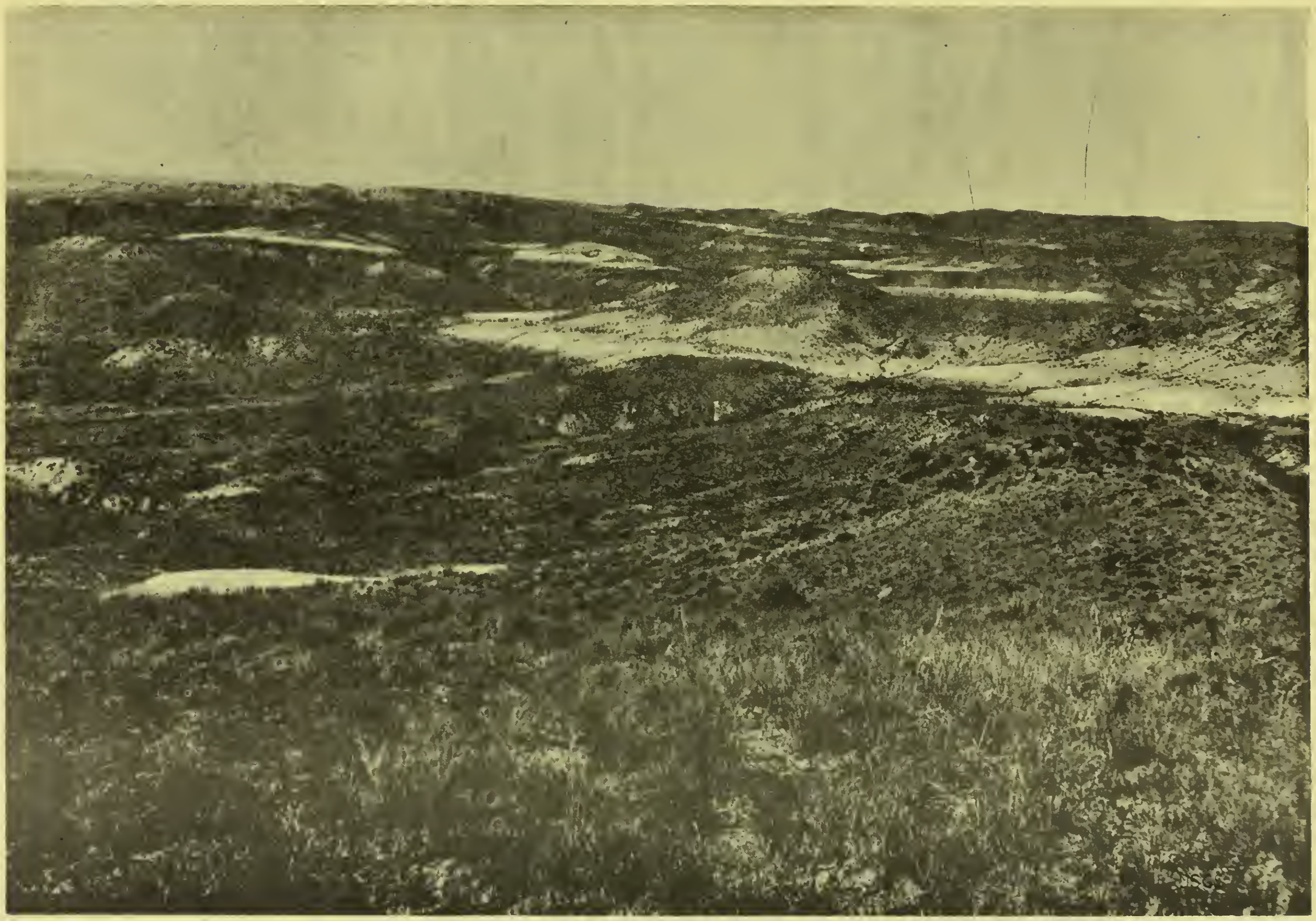
The Crow Indian Reservation is, in its entirety, contained within the Yellowstone River Basin. In other words all of the streams flow either directly or indirectly into the Yellowstone River. Examination of the soils under the direction of the U. S. Soil Conservation Service has resulted in their classification on the basis of the physiography of the area. In that many of the original name designations for the various varieties and sub-varieties are being changed by the survey now underway, class designations only will be used in this preliminary report. These designations do not have any significance other than to provide each soil with a title, and do not relate to capability in any manner.

In general terms, the soils have been classified into four groups:

1. Soils of the valley bottoms
2. Soils of the valley benches or terraces
3. Soils of the uplands and bordering slopes
4. Miscellaneous soils and land types

The classification is based upon internal characteristics of the soil profile including texture, color, structure, consistency, organic content, thickness, and physiographic features of the area such as drainage, relief, and degree of stoniness. Vegetation, such as the types noted in the previous section, and farm crops are observed and their relationship to the soil noted. It is in this manner that the productivity of each soil type may be determined with a relative degree of accuracy.

Soil texture is concerned with the fineness or coarseness of the soil sample according to the relative percentage of sand, silt, and clay. In order of decreasing coarse material content and increasing clay content, the main soil textures of the Crow Reservation are sandy loam, very fine sandy loam, loam, silt loam, clay loam, silty clay loam, silty clay, and clay.



THE LIGHT COLORED OUTCROPS OF BENTONITE PROVIDE A SHARP CONTRAST TO THE RESERVATION RANGELANDS.

Structure relates to the arrangement of the individual particles within the sample and affects the moisture absorption rate and soil filth. Incoherent (sand), friable (silt-loams), and dense (clay soils) are common terms applied to consistency which is concerned with the firmness of the soil and its resistance.

The soils of the Yellowstone River Basin have developed under semi-arid conditions which has resulted in the retention of a large proportion of soluble mineral salts and restricted development of organic content. Therefore, successful cultivation of reservation lands is dependent upon good drainage to eliminate concentration of salts as the water content evaporates from the soil. The drainage may be either natural or artificial but is particularly necessary for irrigated lands. The great majority of the soils in this area are deficient in phosphorus. This deficiency causes the phosphorus disease in range livestock, a condition that is controlled by feeding bonemeal or phosphate salt. Supplemental nitrogen and phosphate are the usual fertilizers used for croplands.

As previously noted the major drainage of the Crow Reservation is confined to the Big Horn River, Little Big Horn River, and Pryor Creek. The alluvial lands of these drainages, the adjacent valley slopes, and some of the uplands, gravelly benches, escarpments and steep slopes all contribute to the soil composition. The generally light color of the soils, which ranges from dominate brownish gray to dark grayish brown, is due to the semi-arid climate and sparse vegetation. The annual return of organic matter to the land under these conditions is not sufficient to darken the soils except in places where supplemental moisture from runoff from higher levels or seepage is present.

Much of the irrigated land on the reservation is included in the first classification group. These generally fertile and well-drained valley soils, deposited by flowing water are highly irregular, varying in texture from clay to sandy loam.

The second soil group are also alluvial soils but are more mature and uniform than those of the valley bottoms. This group primarily occupies the terraces and benches bordering the stream valleys to heights of up to 200 feet above the valley floor. They are fertile, medium textured, and commonly friable and free-working, and with proper land management are quite capable of supporting any crops or vegetation grown in this area.

The soils of the bordering uplands are somewhat restricted in their usefulness due to rough topograph and isolation from water supplies. For these reasons the soils are most commonly used for grazing. Some dry land farming is done.

Miscellaneous soils consist mainly of shallow to moderately deep soil that occurs on strongly sloping to steep lands. The general topography limits their use to grazing, although range management practices are possible in areas.

On the small areas of high benches are soils that are friable and loamy or only slightly sandy in their surface layers. Considerable gravel is contained through the entire profile and they are generally underlain by thick gravel beds and have a well developed lime zone in the subsoil.

Moderately dark soils that have developed from soft shales are common to the high slopes of mild gradient. These soils are silty and friable in all layers and contain an abundance of accumulated lime in the lower subsoil.

The soils on the lower valley slopes are commonly silty or only slightly sandy, and as a rule friable. Their position is usually favorable for the continued accumulation of local alluvium washed from the higher lands. The lack of lime at or beneath the surface and the lack of profile development is accountable to the annual renewal of the surface soil.

A large proportion of the bottom land and terrace soils are developing in comparatively deep deposits of rather clayey and heavy alluvium. The brownish gray surface soils are dominate in this soil which characteristically has slow or imperfect surface and internal drainage. This soil is especially prevalent in the general area in the Big Horn Valley south of Hardin.

Little Big Horn Valley soils are commonly more silty and sandy than those of the Big Horn and they have more friable subsoils and better internal drainage. Most bottom land soils and the lower terraces have a sand or gravel substratum at a depth of 1 to 4 feet below the surface. The soils of the valley are all imperfectly developed or show no profile development; excepting those which occupy the better drained positions and have friable subsoil layers with a definite lime accumulation zone.

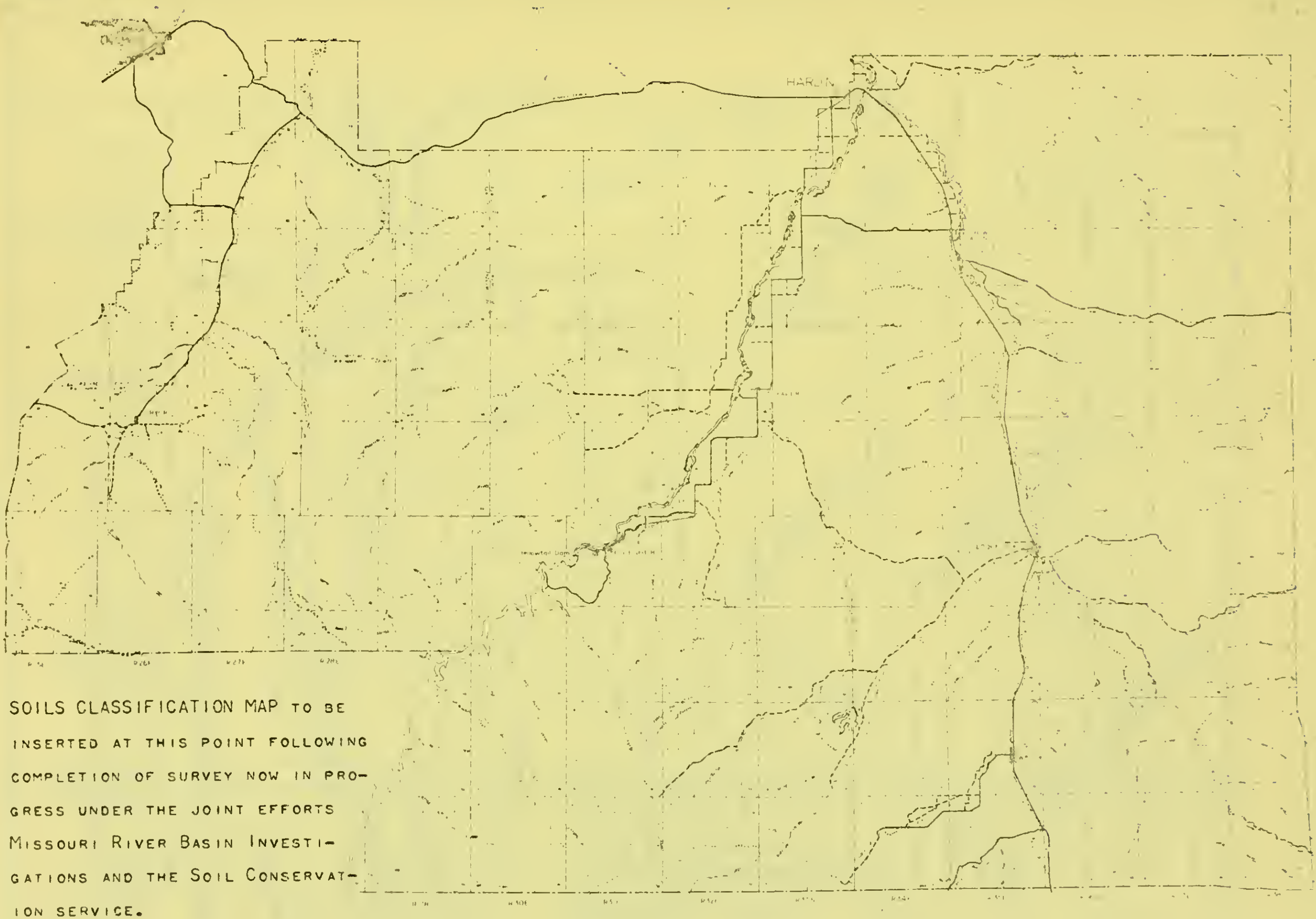
The heavy soils and the more poorly drained areas commonly have poor tilth and contain different quantities of alkaline salts. A sufficient concentration of alkali is present in places to injure growing vegetation.

The degree of concentration is dependent upon the quantity of alkali originally present in the soil, the extent of leaching, the quantity of salts carried in seepage, and the condition of drainage that would tend to remove or concentrate excess soluble salts.

All of the above soil types, except for those noted as common to the uplands, high benches, and higher valley slopes, occupy positions below irrigation ditches. Prior to the development of irrigation, the agricultural use of the heavy soils was restricted to grazing. Soils having friable, silty or loamy profiles were used largely in the production of wild hay and small grains under dry-farming methods. The use of irrigation and management practices that include use of manures, fertilizers and the plowing under of crop residues gradually improves the tilth of heavy soils. With the introduction of similar practices to soils of lighter texture they become productive for nearly all crops adapted to the area. With irrigation, the friable soils are adapted to a wide variety of grain, forage, fruits, vegetables, and root crops. Sugar beets and alfalfa, with adequate irrigation, have proved to be better adapted to the heavy, moderately salty soils than most of the other crops produced on the Crow Reservation.

GENERAL DESCRIPTION OF SOILS ON THE GENERAL SOILS MAP

1. Clay soils of rolling to steep uplands and valleys.
2. Loam and clay soils of hilly to steep uplands.
3. Loam and silt loam soils of rolling to very steep uplands and valleys.
4. Loam, silty clay loam and silty clay soils of major stream valleys.
5. Loam and gravelly clay loam soils of gently sloping to moderately steep gravel terraces.
6. Nearly level to gently sloping loam and silty clay loam soils of the major stream valleys.
7. Loam and channery loam soils of rolling to steep and very steep shale and burned shale uplands.
8. Loam and channery loam soils of rolling to very deep shale uplands and valleys.
9. Sandy loam soils of undulating to hilly sandstone uplands and valleys.
10. Silty clay loam and clay loam soils of gently undulating to moderately steep gravel terraces.
11. Loam and silty clay loam soils of rolling to hilly shale uplands.
12. Sandy loam soils of undulating to hilly sandstone uplands and valleys.



SOILS CLASSIFICATION MAP TO BE INSERTED AT THIS POINT FOLLOWING COMPLETION OF SURVEY NOW IN PROGRESS UNDER THE JOINT EFFORTS MISSOURI RIVER BASIN INVESTIGATIONS AND THE SOIL CONSERVATION SERVICE.

13. Silty clay and channery loam soils of undulating to very steep hard shale uplands.

14. Clay loam and loam soils of sloping to hilly mixed hard shale and sandstone uplands.

15. Loam, clay, and very channery silty clay loam soils of moderately steep to very steep limestone and shale uplands.

16. Loam and very gravelly to bouldery loam soils of sloping to moderately steep valleys, benches, and limestone uplands.

17. Clay loam and silty clay loam soils of sloping to steep shale or gravel mantled uplands and valleys.

18. Loam, clay loam and clay soils of moderately steep to very steep mixed shale and limestone uplands.

19. Clay loam, silty clay loam and channery loam soils of hilly to steep shale and hard sandstone uplands.

20. Silty clay loam and silty clay soils of gently undulating to moderately steep gravel terraces.

21. Clay soils of hilly to steep clay shale uplands.

22. Silty clay loam soils of hilly to very steep shale uplands.

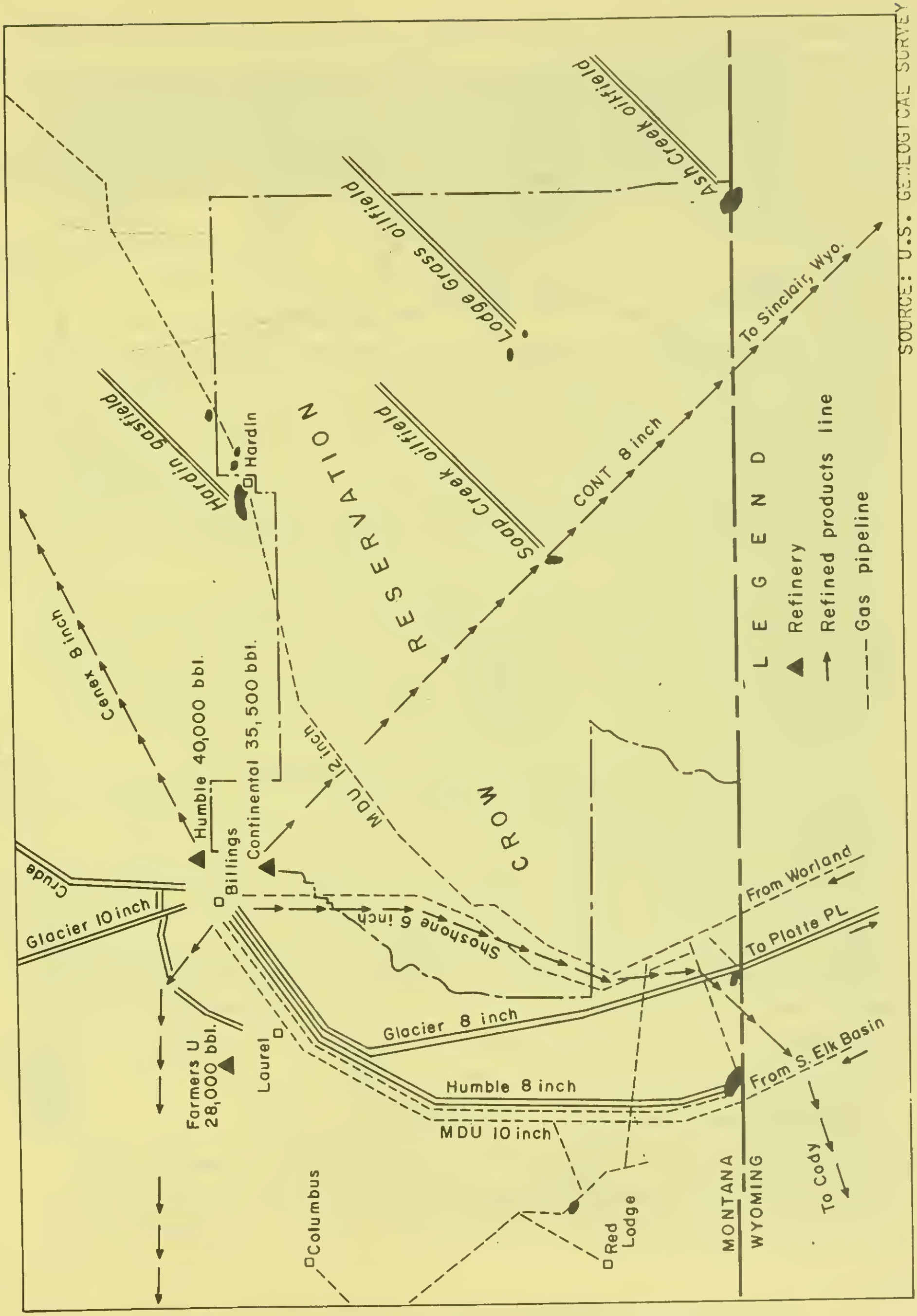
23. Loam soils of steep shale and hard sandstone uplands.

24. Clayey soils of sloping to rolling uplands and valleys.

The Soil Conservation Service and the Missouri River Basin Investigations of the Bureau of Indian Affairs are nearing completion of their joint survey and classification of soils on the Crow Indian Reservation. The material contained in this brief description is only in general terms although a complete analysis is available for selected areas from either of the mentioned agencies. It is anticipated that more complete information will be available prior to the final report of the Crow Reservation Comprehensive Plan and will be included in this published document.

MINERAL RESOURCES:

The principal sources of mineral revenues on the Crow Reservation have been from oil and gas production. This is not to say that these are the only minerals to be found as sand and gravel, clay, coal, clinkers, and



SOURCE: U.S. GEOLOGICAL SURVEY

building stone also provide some income. In addition potential exists for commercial production of gypsum, sandstone, limestone, and volcanic ash all of which are found on the reservation in virtually undeveloped deposits. A more favorable leasing and royalty regulation would quite possibly increase the likelihood of early development by making the production of the resources an economically feasible operation.

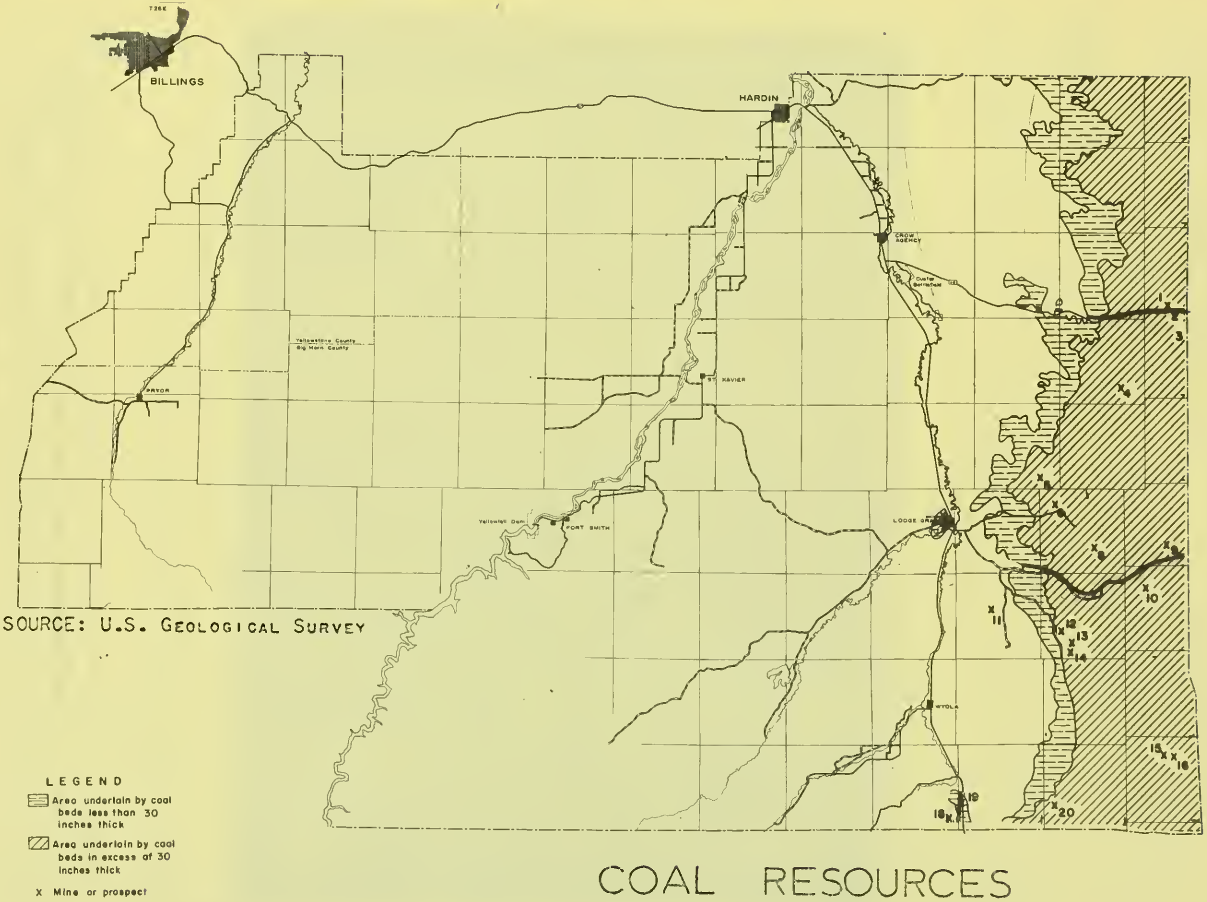
To date, the great majority of tribal and individual income from mineral production has been from oil and natural gas production. Royalties and lease income from these sources should remain fairly stable for the next 5 to 10 years and then gradually decrease, as existing supplies become expended. With the expiration of tribal mineral rights on individual trust land within the last year oil and gas exploration has become more active and it is possible that new small fields may be discovered. However, due to the previous drilling of the larger known structural features that had the potential of oil or gas production, the possibility of a large discovery field appears remote.

Three oilfields and one gas field exist, at least in part, within the Crow Reservation. The Soap Creek oilfield and Lodge Grass oilfields are wholly within the reservation boundary. Ash Creek oil field straddles the Montana-Wyoming border with the Montana portion within the reservation. The Hardin gasfield also lies partially within the Crow lands.

A comparison of average prices paid shows the Lodge Grass and Soap Creek fields exacting $1.18 per barrel for 20°API gravity oil and Ash Creek's 34°API gravity oil receiving $2.18.

Most of the coal on the reservation occurs along the Rosebud-Wolf Mountains along the eastern edge of the reservation. These coalbeds which are extensive occur in a series of formations having about 4° of inclination in a general easterly direction. This incline causes coal outcrops to occur along the west slopes. The outcrops have burned in most instances causing a reddish discoloration of the overlying strata as the burning coal fused the shales and sandstones on the surface to form iron oxide clinkers.

To date coal production on the reservation has been limited to the mining of the fuel for personal use and local markets. However, coal underlies approximately 330,000 acres of Crow Reservation land that can be produced by strip mining at a relatively low cost. The deposits near



SOURCE: U.S. GEOLOGICAL SURVEY

COAL RESOURCES

Colstrip to the northeast of the reservation and those near Sheridan to the southeast are good examples. It can be assumed that the coal on the reservation, ranked as subbituminous C, has similar characteristics.

It is safe to assume that the Crow Reservation contains a minimum of 5 billion tons of coal and possibly as much as 2 to 3 times this amount. Accurate reserve estimates cannot be made without access to the individual test cores in that coal beds are characteristically lens shaped. Such changes in thickness, the continuity of the beds, and changes in thickness of associated formations are all necessary to estimate reserves.

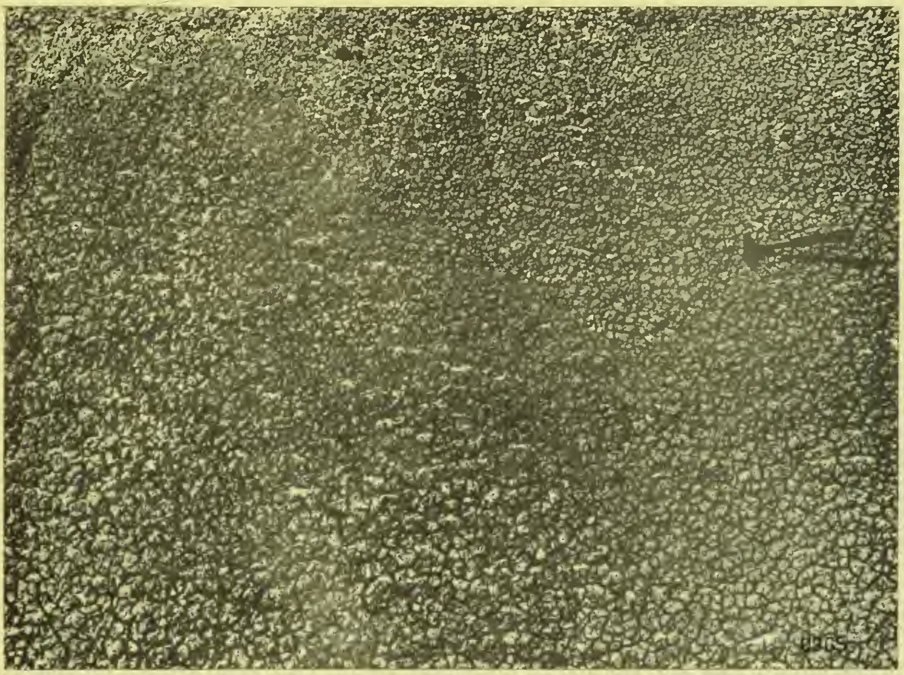
The prospects are good for future development of coal on reservation lands is promising for electric power generation and for production of liquid and gaseous fuels and chemicals. The need to supplement natural gas by synthetic production from coal appears to be inevitable as consumption of the exhaustable natural resource is rising.

Within the past five years the Montana Power Company constructed a 180,000 kw. steam-electric plant at Billings that is fired by coal from the Coalstrip field. Extensive prospecting permits have been issued to Peabody Coal, Gulf Oil, Shell Oil, and the Westmoreland Resources Group by the Crow Tribe. The permits include approximately 30,000 acre feet of water that is necessary for production. Applications for leases have been made.

Although bentonite has been used locally as a canal and pond sealand, there is no recorded production of the mineral on the reservation. Certain unusual qualities of this type of clay lead to its utilization in industry. When wet, it swells to many times its original volume, and thus its application as a sealant for ditches, dam foundations, and drill holes. When it is allowed to stand after adding water, it forms a gel that liquifies when agitated. This is a property known as thixotrophy, and one that is valuable to the drilling industry as a suspension mud for heavy minerals. Bentonite also has use as a paper filler, foundry sand bonding agent, a carrier for insecticides and fungicides, and as a bonding agent for pelletized iron ore.

The U. S. Geological Survey estimates that 180 million short tons of bentonite exist on the reservation. The deposits occur in belts usually averaging over 50 feet wide and under less than 30 feet of overburden. The thixotropy characteristics of the deposits are generally not as good as those of the Wyoming bentonites thus limiting their usefulness in drilling muds. However, they are suitable for all other uses noted above.

Development of Crow bentonite has been affected by the well established Wyoming producers who are now adequately supplying the market and to some extent by leasing requirements that set royalties at 10% of the value at the nearest shipping point. In that substantial investments are necessary for plant construction and market development, the raw material must be obtained at a low cost. The Crow deposits do approach the Wyoming mineral in quality and it is expected they will be utilized sometime in the future. Royalties on production could become an important part of future tribal income, and careful attention should be given to a more equitable royalty rate.



As the mineral dries out bentonite assumes a "popcorn" texture.

Sandstone from several areas on the reservation has been used locally for building stone. Several buildings at Crow Agency have been constructed from sandstone quarried about 1½ miles east of the Agency. The Big Horn County Courthouse at Hardin was built by the W.P.A. from quarries near Fort Smith. Undoubtedly there are other locations on the reservation where the building stone could be quarried but the economic potential is limited due to the distance to markets and the drab, uniform gray color of the material.

Clinkers have been quarried and used as decorative stone in building construction where the varied bright colors and rough uneven surfaces make the material attractive for some applications. Increased use of sandstone, limestone, and clinkers does not appear too promising. However, there should be a continued small local use.

Clinkers, otherwise known as slag, scoria, and porcellanite is a partially baked, partly vitrified rock material that exists on the reservation in several million ton quantity. Heat from burning coal in underground deposits oxidizes the iron in sandstone and shale overburden enough to turn the rock a reddish color. Numerous outcrops of varying thicknesses and extent occur on the reservation and they are principally used for road surfacing. In other localities outside the reservation clinkers have been crushed and screened for roofing granules, used in walkways, decorative building stone and as a concrete additive where pozzolan tests are positive. Because of the low value of the clinker which prevents long distance transportation, the greatest potential for reservation clinkers is for road surfacing on a local basis.

Expanded Aggregate manufacture for a lightweight material for use in concrete is a growing industry. A clay or shale that will expand suddenly when heated to an incipient fusion temperature below 2,200°F to a firm cellular product are required for economic concrete production. The expandable clays and shales are low-value bulk materials and must be mined near the expansion plant and the market. Claggett shale, which meets industry standards, is presently mined just west of the reservation border. The same formation crops out extensively on the reservation and shales with similar qualities can probably be found. To be exploitable, future discoveries would have to compare both in quality and in cost of delivery to the plant with materials presently being produced. Such shales represent a very minor potential source of revenue because of the relatively small amount utilized and the current existence of alternate sources nearer production facilities and markets.

Gypsum has a low unit price and is used mainly in the manufacture of wallboard and plaster, and as a set retardent in portland cement. Another important use of this mineral salt is its use as a soil conditioner to improve the fertility and physical properties of most soils. Massive deposits are exposed in several places in both the Big Horn and Pryor Mountains. Because of the low unit value of gypsum, access to deposits and distance to markets are important considerations prior to development of resources.

A detailed examination and evaluation is needed to determine if there are gypsum deposits on the reservation that are suitable for exploitation. The grade, tonnage, access, and mining conditions would have to equal or exceed other deposits in adjoining counties. West of the reservation gypsum deposits occur in beds that are the stratigraphic equivalent of those found on the reservation.

Due to the unusual quality of gypsum that makes it helpful in decreasing the alkalinity of sodium carbonate soils, the tribe may find it to its advantage to develop some resources for use in reclaiming wasteland areas - particularly where such wastes occur in irrigation projects.

Limestone and dolomite are used in the building and chemical industries as well as for agriculture. Limestone and dolomite are widespread in the United States, but many deposits suitable for industrial use have already been depleted. Thus, some deposits farther from markets have become economically valuable - a trend that will undoubtedly continue. The largest use of limestone is in the manufacture of portland cement. It is also used in the manufacture of hydrated lime - the second largest tonnage chemical in use in the United States.

Limestone on the reservation, despite huge reserves, has no foreseeable potential for use in cement manufacture due to the transportation and distance to population centers. However. the closeness of coal beds as a fuel source could be advantageous, although at the present time this is not considered to be of significant value.

The mineral has been mined for about 40 years just west of the reservation at Warren. Most of this material is used to supply lime needed in sugar beet processing.

Clays and shales on the reservation appear to have limited potential. Their principal use is for ceramic products such as brick. At the present time one clay pit is operational on an intermittent basis near Pryor. The clay is trucked about 30 miles over paved roads to the Lovell Clay Products Company plant at Billings. Clay from this pit is blended in varying proportions with clays mined near Billings for brick production. Blending is necessary since the reservation clay has poor forming qualities. As an asset, its firing color is a dark-reddish-brown to almost black which makes possible brick production of a variety of colors by blending with lighter colored clays. Transportation costs to market areas and the discovery of better clays will likely prevent utilization at a rate much greater than the present 5,000 cubic yards per year.

The Lovell claypit, near Pryor, is one of the few open-pit extractive industries in operation on the Reservation.

Sand and Gravel deposits are widespread on the Crow Reservation with the principal sources on the gravel terraces along the Big Horn and Little Big Horn Rivers. Royalties received from leasing gravel deposits have been the Crow Tribe's largest source of income from mineral resources other than oil and gas. Usage will probably continue at the present rate of 25,000 to

This gravel pit, located south of St. Xavier, provided most of the aggregate used in construction of Yellowtail Dam.

100,000 yards per year mostly dependent upon plans of the Montana Highway Department the largest consumer. No extremely large projects, such as the construction of Yellowtail Dam, which utilized over 2,000,000 cubic yards, are in the forseeable future. The usual royalty for sand and gravel is about 5 cents per cubic yard.

Silica has a large variety of industrial uses and large quantities are obtained from silica sand deposits where sandstone or quartzite have been weathered, reworked, and reconcentrated. Industrial specifications vary according to the use and for most applications it is only necessary to wash and size the mined material. Distance to market and poor access have curtailed silica development on the Crow Reservation. As these conditions improve, possibly as the result of extensive coal exploration activity, a survey should be made of the various sandstones to determine whether they meet industrial specifications. No silica production has been recorded from on reservation sources.

Uranium potential definitely exists for the development of small, high grade ore deposits in the Big Horn and Pryor Mountains. The 1948 Atomic Energy Commission program which provided for guaranteed minimum prices, a discovery and production bonus, plus other incentives, stimulated one of the most intensive searches for ore in history. Uranium mineralization in commercial quantities was found in the Pryor Mountains a short distance off the reservation in 1955. Only minor discoveries have been made on the reservation up to the present. However, the possibility of undiscovered high grade deposits is good as exploration was not complete when the A.E.C. phased out its incentive program.

An increase in active uranium prospecting cannot be expected until some time in the future when the price and demand increase. With the filling of the Big Horn Lake, much of the virtually unaccessible country bordering the Big Horn Canyon and tributary streams has become easily accessible by boat. Undoubtedly, the easier access will stimulate prospecting, at least for a brief period, not only for uranium but for all other mineral deposits in the area.

Copper ore has not been produced from the reservation, and the only reported occurrence was described by a Billings man who did not reveal the exact location, although his prospecting permit covered the portion of the Big Horn Mountains adjacent to the Montana-Wyoming border. The deposit probably would be in or associated with the Precambrian rocks forming the core of the mountains. It appears doubtful that any significant copper resource exists on the reservation.

Volcanic ash occurrences on the reservation are much more widespread and numerous than had been known previous to the 1964 Bureau of Mines exploration. This search was made at the time the construction of Yellowtail Dam was authorized when a local source of pozzolanic material was needed as a concrete additive. The use of a low cost pozzolan results in a substantial savings in concrete costs and makes the concrete more workable during placement and more resistant to acid water action. The Bureau of Mines could have discovered other occurrences during their search. However, no attempt was made to determine even the extent of individual occurrences because of their soil cover. However, it is believed that some of them extend for several acres. Markets could possibly be developed for the use of volcanic ash particularly since the Crow mineral has been tested and proven suitable for use as a pozzolan. Other possibilities would be as a carrier material in plastics or insecticides. In that volcanic ash was not known to be a widespread mineral resource of the Crow Reservation prior to the Bureau of Mines investigation, it warrants further study.

Deposits of volcanic ash such as this outcrop have only recently been discovered on the Crow Reservation.

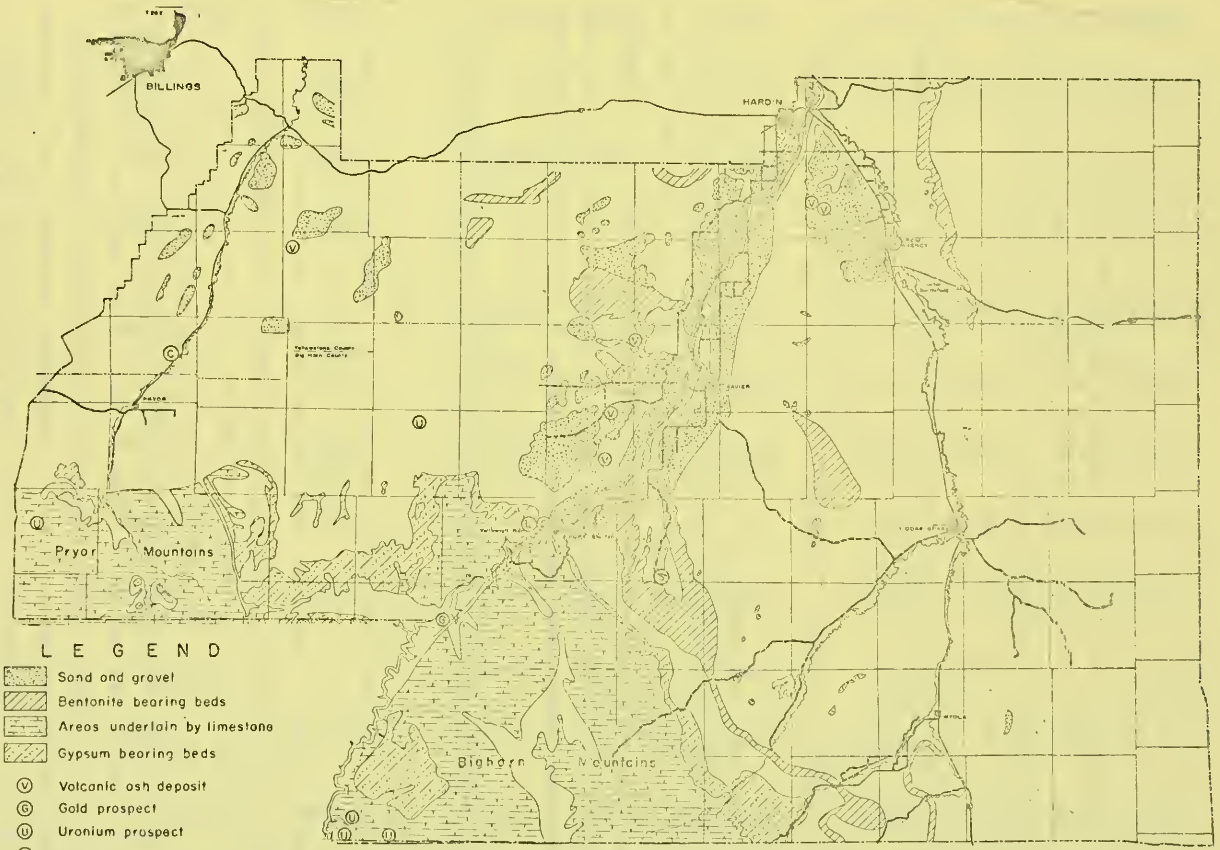
Gold exists in minor quantities in the Big Horn Canyon. It is, however, unaccessable since the filling of the reservoir behind Yellowtail Dam. Lode gold may be associated with the Precambrian rocks in the Big Horn and Pryor Mountains. Detailed prospecting would be required to determine if gold deposits are present.

WATER RESOURCES AND DRAINAGE:

Surface water is the water resources present in streams, lakes, and reservoirs. It supports a varied population of numerous fish, wildlife and man and is the resource that makes the Crow Reservation, and this general region, a scenic and recreational attraction to residents and visitors alike.

The streams of the Crow Reservation are all tributary to the Yellowstone River; they either flow directly into this river or flow into a stream or river that eventually finds its way to the Yellowstone. The western part of the reservation is drained by Pryor Creek; the eastern edge is drained by Rosebud and Sarpy Creeks; and the central portion is drained by the Big Horn River and its major tributary, the Little Big Horn River. All of these major drainages have tributaries that rise in the mountainous areas and are perennial, or year-around, flowing streams but the great majority of the feeder system is made up of intermittent flowing streams that contain water during and immediately after rainstorms and during periods of snowmelt.

The Big Horn River, is by far the largest single source of surface water on the reservation. It is formed by the Wind and Pope Agie Rivers near Riverton, Wyoming, about 150 miles from the Montana boundary. From this point it flows about another 100 miles northeastward to its confluence with the Yellowstone River. The two largest tributaries of the Big Horn are the Shoshone and the Greybull, both of which enter from the west in Wyoming. The Little Big Horn River, Shell and Norwood Creeks enter from the east from their beginnings in the Big Horn Mountains. Just prior to leaving Wyoming, the Big Horn River enters the Big Horn Reservoir which flows through the magnificent Big Horn Canyon to Yellowtail Dam at the mouth of the canyon. After leaving the Yellowtail Afterbay Dam, the Big Horn enters the plains area and has a much broader valley and a generally meandering path. After leaving the reservation north of Hardin, the valley narrows again to a near gorge until it reaches the Yellowstone River floodplain.



MINERAL RESOURCES

L E G E N D

- ░ Sand and gravel
- ▨ Bentonite bearing beds
- ▤ Areas underlain by limestone
- ▧ Gypsum bearing beds
- Ⓥ Volcanic ash deposit
- Ⓖ Gold prospect
- Ⓤ Uranium prospect
- Ⓢ Sandstone quarry
- Ⓒ Claypit
- Ⓛ Limestone quarry

SOURCE: U.S. GEOLOGICAL SURVEY

RECORD FLOW AT STREAM GAUGING STATIONS

Stream	Gaging Sta. Location	Drainage Area (sq mi)	Runoff-(1000 Acre-Ft) Max.	Date	Min.	Date	Discharge (cfs) Max.	Date	Min.	Date
Big Horn River	Near St. Xavier	19,667	3,703	1947	1,557	1940	37,400	6/16/35	112	4/2/67
	Near Hardin	20,700	5,350	1924	1,280	1919	45,400	3/11/29	353	2/14/33
Little Big Horn	At State Line	193	146.6	1944	78.9	1950	2,730	6/3/44	21	12/27/54
	Below Pass Creek	428	215.2	1944	85.6	1940	3,630	6/14/63	12	8/8/61
	At Crow Agency	857	--	--	--	--	8,200	6/23/23	280	6/28/21
	Near Hardin	1,294	234.7	1957	104.1	1954	4,520	4/2/65	0.20	8/7/61
Lodge Grass Cr.	Willow Ck Res.	80.7	50.0	1944	21.1	1950	1,130	6/9/64	3.0	1/31/50
Pass Creek	Near Wyola	111	57.20	1944	13.0	1940	1,150	6/4/44	No Flow	8/10/35
Pryor Creek	At Pryor	117	--	--	--	--	178	6/10/68	3.4	6/24/21
Pryor Creek	Near Blgs	400	65.9	1942	16.7	1940	1,500	5/14/42	No Flow	At Times
Pryor Creek	At Huntley	800	--	--	--	--	2,300	6/5/05	No Flow	7/26/08
Soap Creek	Near St. Xavier	98.3	10.3	1940	34.1	1947	1,30	5/13/42	1.0	1/24/25

The Big Horn River drains an area of 20,700 square miles at an average elevation of 5000 feet. It carries a large volume of water at all times, but in the spring and early summer, when it is generally in flood from the melting snow and ice, its flow is extremely large. The maximum discharge observed at the Hardin gage station occurred on March 11, 1929, when the gage recorded 49,500 second feet at 11.1 feet of height. The minimum flow at this point was recorded about four years later on February 14, 1933, with 353 second feet. But for the regulatory effect of Yellowtail Dam, the Department of Commerce has estimated that the spring flow of 1971 would equal or exceed the 1929 flow. Their estimate is based upon extremely high snow-pack conditions in the mountain areas.

During spring runoff periods the Big Horn is characteristically heavily silt laden. The flow of the river is maintained primarily by the Wyoming tributaries as the Little Big Horn is the only perennial feeder stream on the Crow Reservation. Beauvais, Two Leggins and Woody Creeks are the largest intermittent tributaries from the west and Rotten Grass, Soap, and Tullock Creeks are the largest entering from the east. Beauvois, Rotten Grass, and Soap Creeks all originate in the mountainous regions and flow throughout the year when unusually wet summers occur. There are numerous other smaller tributary streams that feed the Big Horn.

A large supply of irrigation water is supplied by the Big Horn. The three principal diversions are the Big Horn, Big Horn Low Line, and Two Leggins Canals. The Big Horn and Two Leggins units derive their water from on reservation diversions, while that of the Big Horn Low Line is obtained just off reservation to the north of Hardin.

The municipal water supply for the city of Hardin is presently obtained from the Big Horn River. During extended hot, dry periods the system is barely adequate due to limitations of the treatment plant. In addition both the railroad and the Holly Sugar Factory pump water directly from the river. The refinery pumps about 5 million gallons per day during the peak production season which generally lasts about 60 days. After the beet season, the refinery reduces its water intake to the small amount needed for heating purposes. Holly Sugar has announced it plans to close the factory during the current year, and if the closure becomes permanent more water will become available downstream.

The Little Big Horn River is the major tributary of the Big Horn that flows through the reservation. As with several of its feeder streams, the Little Big Horn begins as a small stream in the Big Horn Mountains in Wyoming. From its headwaters to the base of the Big Horn Mountains in Montana the river flows swiftly and turbulently through a narrow picturesque canyon, the walls of which rise to nearly 2000 feet in places. After leaving the canyon, the Little Big Horn becomes a meandering stream bordered by terraces and pediment slopes until it reaches its confuence with the Big Horn River, some 125 miles from its source. About two miles above its juncture with the Big Horn, the Little Big Horn River has been diverted from its natural channel on the west side of the valley to a man-made channel on the eastern side. The Little Big Horn drainage covers some 1,190 square miles at an average elevation of about 4000 feet. Lodge Grass and Pass Creeks are the major tributaries of the Little Big Horn with perennial flow. Numerous other tributaries flow during periods of heavy runoff with large volumes of water.

The quantity of flow in relation to the area drained by the Little Big Horn becomes progressively less as it moves northward. The primary reason for this phenomena is the decreasing precipitation as the higher elevations are left behind and the greater loss to transevaporation. Occasionally ice jams occur during the spring runoff periods and cause flooding of the low lands, which are chiefly used for pasture or woodland. At the gauging station near the Montana-Wyoming line the maximum recorded flow of the Little Big Horn was 2,730 second feet on June 3, 1944. This station recorded 21 second feet on December 27, 1954 for the minimum flow. 8,200 second feet was the maximum discharge recorded at the gauging station near Crow Agency. This flow occurred on July 23, 1923. Two years earlier, from July 28 to August 6, 1921, a minimum flow of 280 second feet was recorded. Other gauging stations on the Little Big Horn report data proportional to the previous measurements.

Appropriative water rights for the Little Big Horn drainage basin exceed the total supply. The amount of water diverted is therefore less than the water right. The principal diversions are the Antler Land Company, Bozeman Trail, and Forty-Mile ditches, and the Agency, Reno, and Upper Little Horn #2 canals. To impound water for livestock, dams have been constructed across several of the small tributary drains.

Lodge Grass Creek rises in Wyoming and flows about 35 miles across reservation lands to its confluence with the Little Big Horn near the town of Lodge Grass. Lodge Grass Creek is a perennial stream, but much of its water is diverted by canal to the Willow Creek Reservoir about 15 miles south of the Lodge Grass community. This 23,000 acre-feet capacity reservoir was created by a 114 foot dam across the mouth of Willow Creek as it entered Lodge Grass Creek to create a more adequate water supply during the growing season. Water released from the reservoir is diverted at downstream points to the Lodge Grass #1 & #2, Keno, and Agency canal systems. Inadequate diversion structures have caused water shortages even since construction of the dam.

A gauging station located just above the Willow Creek diversion recorded a maximum discharge of 1,130 second feet on June 9, 1964 and a minimum flow of 46.5 second feet for January 17, 18, 25, 30, and 31, 1950. This is the only recording device on Lodge Grass Creek.

Pass Creek is a short perennial tributary of the Little Big Horn River with a drainage basin of about 110 square miles. The only gauging station is located near Wyola just above its confluence with the Little Big Horn. A maximum discharge of 1,150 second feet was recorded on June 4, 1944. A minimum of no flow was recorded on August 10, 1935.

Soap Creek, a tributary of the Big Horn River, is a small stream about 25 miles long with headwaters near Black Canyon. The water supply of Soap Creek is very erratic as is indicated by the gauge near its mouth close to St. Xavier. The maximum flow of record is 1,298 second feet on May 13, 1942 and a minimum of 1 second feet was gauged on January 24, 1925. The Soap Creek canal, a government unit, is the principal diversion unit. There are also several small private ditches.

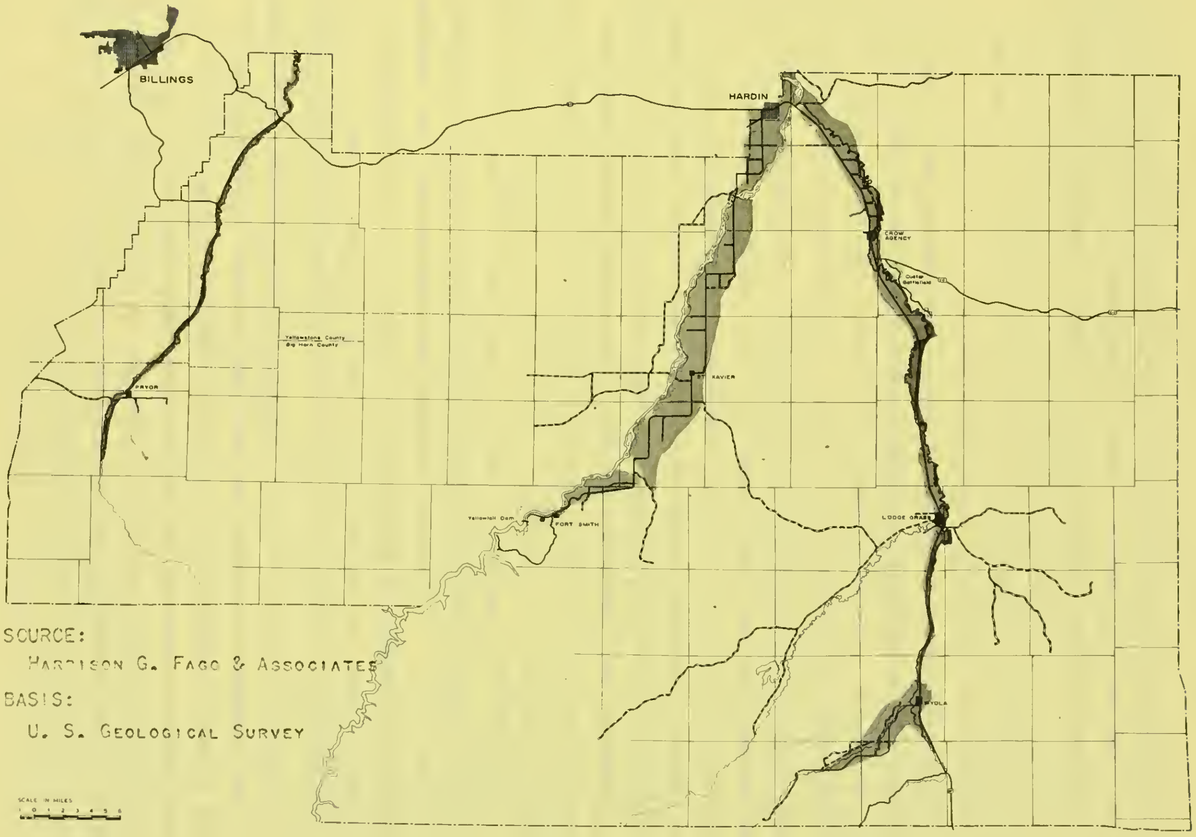
Rotten Grass Creek is a small, sporatic tributary of the Big Horn and enters that waterway from the west near St. Xavier. Sufficent records are not available to indicate the true potential of this stream. Its drainage basin includes 146 square miles. During the years that records are maintained a maximum flow of 688 on June 9, 1968. Several extended periods of no flow are recorded.

Rosebud Creek drains the area of the reservation that lies to the east of the Rosebud Mountains. The Rosebud proper flows in a relatively small valley with a narrow bottom just east of the reservation line. The Rosebud-Wolf Mountains, in which this creek and its larger tributaries rise, are generally described as rugged uplands but they are not lofty. There is not sufficient precipitation and ground water discharge to maintain a perennial flow. During the spring and early summer a considerable amount of water is carried to the Rosebud; but the flow decreases rapidly with the advance of summer. No gauging stations or irrigation use of the Rosebud or its tributaries exist for the portion of the drainage that lies on the reservation.

Pryor Creek rises in the mountains of the same name and flows in a generally northward direction across the western portion of the reservation to its confluence with the Yellowstone River near Huntley. It has a large valley that may have been formed when a now extinct, or relocated, stream that cut Pryor Gap flowed through on its way to the Yellowstone. Pryor Creek has several tributaries, some of which rise in the Pryor Mountains, but none are perennial. Large volumes of water derived from mountain snow-melt, are carried by Pryor Creek in the spring. The valley has considerable deposits of alluvium in places as well as higher terrace gravel along its sides. About 400 square miles of land are drained by Pryor Creek before it leaves the reservation. This creek is used to irrigate considerable areas, particularly in the Pryor town vicinity. The principal diversions are the Colburn Unit and the Pryor Creek Ditch.

Two gauging stations are located on the portion of Pryor Creek that lies on the reservation. At the upstream gauge near the Pryor townsite a maximum flow of 178 second feet was observed on June 10, 1968. The minimum discharge at this point is about 4 second feet on June 24, 1921. The lower gauge is located near the Highway 87 bridge where a maximum flow of 1497 second feet is on record for May 14, 1942 and no flow, probably due to irrigation, has been recorded in several instances.

The smaller Crow Reservation tributaries are distinctly of more recent origin that the master streams. As a general rule their grades are steeper and active erosion is taking place. Even the smallest streams, which flow only during runoff periods, are actively cutting back towards their source and slowly destroying the flat areas between streams. During the late spring and summer one of these streams may work back a number of yards during the progress of a flash storm or sustained rainshower. As a result, a large volume of material is eroded away to be deposited as silt lower down the valley when the streamflow slows.



SOURCE:
Harrison G. Fagg & Associates
BASIS:
U. S. Geological Survey

MAJOR FLOOD PLAIN AREAS

The streams that are underlain by shales are cutting back into the soft beds with considerable rapidity. Even in areas where softer beds underlay the streams the [illegible] are not as narrow and steep-walled as those over harder beds. A thick [illegible] of sandstone close to the surface area in the western portion of the reservation is apparently the cause of the narrow cuts common to the area.

Ground water is the water that lies under the surface of the earth. It may originate from precipitation or from seepage out of lakes, reservoirs, canals, irrigation and similar sources to permeate the soil and form a saturated level. Below the upper boundary, known as the "water table," all, or nearly all of the openings between soil or rock particles, fractures, channels, caves, and other openings are water filled.

Where the water table is only a few feet below the surface and is covered by fine grained soils or sediments, a substantial amount of ground water may be lost through evaporation as capillary action lifts the water to the surface. When the overlayment is of coarse material or the water table is several feet underground, little or no ground water will be lost through evaporation.

An aquifer is the geologic formation that transmits water in sufficient quantity to supply pumping wells or springs. In some areas of the reservation, ground water is relatively difficult to obtain and aquifers yielding only a few gallons of water per minute are of importance. In other areas, where aquifers produce several hundred gallons per minute (GPM) a low production well will usually be abandoned. Aquifers may be either artesian or water-table. Artesian aquifers are ground water resources confined between two levels of impermeable material and the water is under sufficient pressure to rise above the top of the aquifer if penetrated by a well. If the pressure is enough to raise the water to the top of the well, the well will flow. Water table aquifers are exposed to the surface and contain a saturated and unsaturated zone. When penetrated by a well, the water level in the well will be the same as that of the water table. Therefore, it is necessary to hydraulically pump water-table wells to the surface.

Adequate water for domestic and stock uses is available throughout most of the reservation from wells although in some locations deep drilling is necessary to obtain a sufficient supply. Where irrigation projects exist, water bearing unconsolidated deposits occur from one to ten feet below the surface. In other areas the unconsolidated deposits are generally water bearing but depths of ten to thirty feet must be drilled to reach the relatively thin saturated zones. All of the wells to the north of Crow Agency and some of the wells to the south reach unconsolidated aquifers. In most locations to the south of town, abundant supplies may be readily obtained from Parkman sandstone aquifers at depths of 100 to 200 feet. To the north of the agency, this formation is either missing entirely or is not thick enough to provide sufficient quantities of water to justify the drilling expense. But for the high cost of drilling, water could probably be obtained by developing supplies in other deep formations in these locations. However, in these cases, well depths could be up to 3000 feet.

In the places to the west of the Little Big Horn River where no unconsolidated deposits are evident, water in quality and quantity for domestic and stock use is generally not available at economically feasible depths. The farmers of this area who do not have wells or whose wells produce water of unsuitable quality, generally purchase water in Hardin and truck it to their homes for cistern storage.

Some reference has been made to water quality. Quality is dependent upon the degree of presence of various minerals in the supply. Some dissolved constituents are desireable within limits while other minerals are not desirable due to their harmful effects.

Carbonate (CO_3) is dissolved from many rocks, particularly those containing calcium and magnesium carbonates. The carbon dioxide in the chemical makeup of water aids in dissolving these minerals. Carbonate quantity in water is usually very small although bicarbonate (HCO_3) may be present in appreciable quantities. Bicarbonate presence is usually minor in water from granite and similar rocks, but limestone formations may yield

U.S.G.S. GENERALIZED GEOLOGY OF CROW RESERVATION

System	Series	Formation			Thickness (feet)	Lithologic character	Water-bearing properties
Quaternary	Recent	Alluvial fans			0-40	Present where major tributary streams enter main valley. Consist principally of sand and gravel deposited during periods of heavy rainfall or rapid snowmelt. Mantle low terraces and alluvial bottom land and, in places, completely mask terrace edges. Extensively irrigated.	Recharged principally by canal leakage, infiltrating irrigation water, and influent seepage from streams. Water table generally shallow and drainage problems common, particularly near the edges of the fans. Locally, yields of 100 gpm can be developed from wells.
		Alluvium			0-25	Flood-plain deposits of the Little Bighorn River, as much as half a mile wide in places. Consists of 5-10 feet of sand, silt, and clay overlying 10-15 feet of very coarse gravel. Generally mantled by slope wash from higher lands or by alluvial fans of tributary streams. Surface brushy and cut by old meanders; used principally for grazing.	Recharged principally by infiltrating flood water, by precipitation, and by underflow from both irrigated terraces and tributary stream valleys. The fine materials overlying the gravel drain slowly and are much less permeable than the gravel. Locally, yields of 100 gpm can be developed from wells. Water varies widely in chemical quality; in some places is too mineralized for irrigational or domestic use.
	?	Undifferentiated surficial deposits			0-60	Principally slope wash consisting of unsorted sediments. Present along base of steep slopes on the east side of the Little Bighorn River and in an area north and west of Lodge Grass.	Relatively impermeable.
	Pleistocene	Deposits underlying terrace 1			0-30	River deposits of about 10-20 feet of sand, silt, and clay resting on coarse gravel 10-15 feet thick. In most places gravel appears to be continuous with that underlying the alluvial bottoms. Mantled, in places, by alluvial fans. Surface is gently sloping and is 10-15 feet above the river and somewhat less above the alluvial bottom land. Most irrigated land is on terrace 1.	In many places the surficial layer of fine-grained sediments partially confines water under pressure in the gravel. Recharged principally by applied irrigation water, canal seepage, and underflow. Locally, supplies as much as 100 gpm can be developed from wells. Water varies widely in chemical quality and in some places is too highly mineralized for either irrigational or domestic use.
		Deposits underlying terrace 2			0-25	River deposits of about 5-10 feet of sand, silt, and clay, overlying a bed of moderately coarse gravel 15-20 feet thick. Surface is 100-125 feet above the Little Bighorn River. Terrace 2 is most prominent terrace in area but occurs only as disconnected remnants on west side of river. Irrigated northwest of Lodge Grass. Most of land proposed for irrigation is on this terrace.	Where terrace deposits are recharged by infiltrating irrigation water, domestic and stock supplies can be obtained readily from the gravel; but where they are recharged solely by precipitation, water can be obtained only near the middle of the more extensive remnants and from small springs issuing from the base of the gravel along the terrace escarpment. Because terrace 2 is naturally well drained, waterlogging is not likely even though the terrace is irrigated extensively. Ground-water discharge from the terrace, however, could result in additional waterlogging of the lower lying terrace 1.
Cretaceous	Upper Cretaceous	Hell Creek			600±	Present in hills on east side of river near Lodge Grass; consists of interbedded massive light-brown to gray concretionary sandstone and dark-gray to green shale. Sandstone beds support a scattered growth of coniferous trees.	Where saturated, sandstone beds probably could supply sufficient water for domestic and stock wells. No wells in the area are known to tap this formation.
		Montana group	Bearpaw shale		600±	Borders the area for 12 miles on the east side of the river, underlies the valley for about 7 miles north of Lodge Grass, and is poorly exposed west of the river valley near Ionia. Upper part consists of dark-gray drab shale that weathers to covered slopes, except where erosion is active. Lower part is more sandy, rich brown, and better exposed; the outcrops are characterized by abundant gypsum crystals. The basal contact is marked by a 1-foot bed of bentonite. About 15 feet above the bentonite is a prominent, dense, dark-gray concretionary bed several feet thick. In sec. 34, T. 3 S., R. 35 E., 46 feet above the bentonite bed, is a 2-foot bed of well-cemented conglomerate containing pebbles half an inch in diameter. The conglomerate is exposed also in secs. 4 and 26, T. 4 S., R. 35 E., but the largest pebbles are about one-eighth of an inch in diameter. Farther south, the conglomerate grades into coarse sandstone.	Relatively impermeable. Weathered part may contain some water, but probably the quantity would be small and the water highly mineralized. Surface deposits of alkali are prominent in some places on lower slopes underlain by the Bearpaw shale. Very low permeability and high salt content characterize soil derived from erosion of this shale. Soil not believed to be irrigable.
			Parkman sandstone		250-300	Lower part consists of massive brown sandstone and upper part of sandstone interbedded with drab gray shale. Basal sandstone is prominent from Lodge Grass to Benteen and forms sheer cliffs but northward grades to sandy mudstone, shows a more subdued topography, and appears to be gradational with the underlying Claggett shale member of the Cody. Locally, a massive ferruginous sandstone bed is in the upper part of of the Parkman, but it is not as uniform nor as continuous as the lower sandstone bed.	Lodge Grass obtains its municipal supply from a well that taps the Parkman. Wells that tap the basal sandstone yield adequate supplies of water; but toward the north, where mudstone is present, yields are smaller and the water is more mineralized.
			Cody shale*	Claggett shale member	360-400	Dark marine shale containing a few lenses of silty sandstone. Exposed slopes are gradual except where severely eroded.	Small supplies of mineralized water can be obtained from the weathered shale. Wells D5-35-3cc and D4-35-21cdl are reported to obtain water from sandstone beds in the Claggett. Because the shale contains a somewhat large amount of soluble material, the slopes underlain by it are covered in some places with alkali.
				Shale member equivalent to Eagle sandstone	275±	Dark-gray shale containing numerous ironstone concretionary zones and thin sandy and bentonitic beds. Poorly exposed in the area. Gradational with both overlying and underlying members, thus the mapped boundaries are not exact.	Locally, yields small amounts of highly mineralized water.
		Montana group		Telegraph Creek member	550±	Gray to black sandy shale exposed extensively near the north end of the area. The lower part is more sandy than the upper and is characterized near the base and at the middle by thin, nonforming concretionary sandstone.	Relatively impermeable. Water probably highly mineralized.

System	Series	Formation			Thickness (feet)	Lithologic character	Water-bearing properties
Cretaceous	Upper Cretaceous	Colorado group	Cody shale*	Niobrara and Carlile shale members	800-900	Dark-gray shale containing thin concretionary and bentonite beds. Only upper part exposed in the report area. Except where actively eroded by streams, outcrops weather to covered slopes.	Nearly impermeable. Would yield little or no water to wells.
				Greenhorn calcareous member	100±	Calcareous dark-gray shale containing concretionary beds.	Do.
				Lower shale member	200±	Dark-gray bentonitic shale containing bentonite and concretionary beds.	Do.
			Frontier		250-400	Gray sandy shale interbedded with shaly sandstone. Upper and middle parts contain prominent bentonite beds; lower part is less sandy and consists mainly of dark-gray shale.	Upper part may yield small amounts of water; lower part is not water bearing.
			Mowry shale		300-350	Siliceous gray shale interbedded with thin beds of siltstone and sandstone; thin beds of bentonite near top and base of formation. Resistant to erosion and forms bare silver-gray hogbacks and ridges.	Possibly would yield small amounts of mineralized water.
	Lower Cretaceous		Thermopolis shale		550-650	Soft dark-gray shale. Upper part contains beds of bentonite; lower part sandier than upper part.	Nearly impermeable. Would yield little or no water to wells.
		Cloverly			200-300	Upper part consists of interbedded thin layers of sandstone, siltstone, and shale. Lower part consists of conglomeratic sandstone as much as 150 feet thick but which, in some places, is interbedded with siltstone and shale.	Yields moderate to large supplies of water to wells that tap the lower part of the formation. Water is under artesian pressure and wells in favorable topographic locations will flow. Water is mineralized but is suitable for stock, domestic, and limited irrigational use. Despite its great depth, this formation may be the only significant source of water supply in wide areas in this general region.
Jurassic	Upper Jurassic	Morrison			150-300	Greenish-gray to red variegated shale, siltstone, and sandstone.	Yields small quantities of water to wells tapping the more permeable beds.
		Ellis group	Swift		150-175	Greenish-gray shale and sandstone; some glauconite-rich beds.	Possibly would yield small quantities of water to wells.
			Rierdon		300-325	Soft light-brown calcareous shale; thin beds of calcareous sandstone and limestone near top.	Probably not water bearing.
	Lower Jurassic		Piper		225-250	Interbedded red siltstone, sandstone, and shale, limestone, and a basal red gypsiferous siltstone and sandstone; thin beds of gypsum near middle of formation locally.	Relatively impermeable. Water probably too mineralized for general use.
Triassic ? Permian		Chugwater			350-375	Interbedded red silty sandstone and shale; some beds of gypsum locally.	Relatively impermeable.
Pennsylvanian		Tensleep sandstone			40-150	White to light yellowish-gray medium- to fine-grained sandstone.	Yields moderate to large supplies of water to wells that tap thick sections of the formation. Oil companies that have made drill-stem tests report that water is fresh. Some flowing wells in Soap Creek area, T. 6 S., R. 32 E., have yielded more than 500 gpm with several hundred feet of head (Thom and others, 1935, p. 31, 131-2).
		Amsden			250-300	Dark-red and purple to gray shale, sandstone, and siltstone; some limestone and cherty beds.	Large yields of water reportedly are obtained where rocks are brecciated or limestone is cavernous (Thom and others, 1935, p. 31, 132). However, whether the water comes from the or the overlying or underlying formations is difficult to determine.
Mississippian		Madison limestone			700-1,000	Massive light-gray limestone, locally dolomitic. Forms prominent cliffs and canyon walls.	Formation contains numerous caverns, open joints, and fissures, and is the most prolific water-bearing formation underlying the area. However, because the water is highly mineralized and the aquifer lies at such great depth, the Madison limestone is not considered as an economical source of supply. Oil test well D1-32-23bdd has a very large flow of water under high pressure. The water is used to supply a hot-water bathing pool and, after storage in surface reservoirs, to irrigate a large acreage 5 miles west of Hardin.
Devonian (?)		Three Forks(?) and Jefferson(?), undifferentiated			200-300	Light grayish-brown sandy limestone, dolomitic near base.	Probably would yield considerable water to wells, especially where brecciated.
System	Series	Formation			Thickness (feet)	Lithologic character	Water-bearing properties
Ordovician	Upper Ordovician	Bighorn dolomite			200-400	Massive light-brown to gray dolomite and limestone. Forms prominent cliffs and breaks characteristically into very large blocky boulders.	Locally, may yield large quantities of water from open joints or cavernous limestone beds.
Cambrian	Upper Cambrian	Gallatin			200-250	Thin-bedded gray to brown glauconitic limestone; conglomerate composed of flat limestone pebbles locally.	Possibly would yield small quantities of water to wells, especially where brecciated.
	Middle Cambrian	Gros Ventre			500-600	Chiefly soft greenish-gray shale containing sandy shale and thin glauconitic sandstone beds at base and limy shale and shaly limestone near top.	Nearly impermeable. Would yield little or no water to wells.
		Flathead sandstone			50-75	Coarse-grained reddish-brown sandstone and conglomerate.	Possibly would yield small to moderate supplies to wells.
Precambrian						Gray to reddish granitic rocks..........................	Nearly impermeable. Would yield little or no water to wells.

*The division of the Cody shale is according to the official usage of the U.S. Geological Survey.

several hundred ppm (parts per million). When evaluating water supplies the presence of bicarbonate is an important consideration in pating the supply for domestic or agricultural use - especially irrigation.

Calcium (C_A) and magnesium (M_G) are dissolved from many rocks present on the Crow Reservation including limestone, dolomite, shale, and gypsum. These minerals cause "hardness" in water and are the primary causes for scale in hot water pipes, boilers, and heaters. If present in suitable proportions they counteract the harmful effects of sodium on the soil and tend to preserve soil texture. Under such conditions, they are a desirable component for irrigation water.

Sodium (Na) and potassium (K) are derived from nearly all rock sources, with sodium usually present in much greater quantity than potassium. This is true for both ground water and surface water resources. If sodium constitutes most of the basic water ions, the water may not be suitable for irrigation due to the detrimental effect of sodium on the soil.

Sulfate (SO_4) is primarily dissolved from gypsum but is also obtained through oxidation of iron sulfides. Sulphur is an essential plant nutrient but when combined with calcium and magnesium it contributes to the scale forming properties of those minerals.

Chloride (Cl) may be present in the water naturally in large amounts as it is dissolved from many different rocks and soils. It may also be an indicator of pollution caused by return drainage from industrial, domestic, or municipal effluents.

Nitrate (NO_3) is usually not found in sufficient quantity to cause harmful effects, but when the mineral level exceeds 45 ppm it may cause a serious blood condition if used in infant-feeding formulas. When appreciable quantities of nitrate are found, a serious indicator of pollution is evident as nitrate is the final product of acrobic decomposition of nitrogenous organic matter such as sewage, plant and animal wastes.

Floride (F) is generally present in water under natural conditions in quantities of less than 1 part per million. When a level of 1.5 ppm is reached in water used by children, the tooth enamel may discolor. The incidence of tooth decay, however, will generally decrease with the increase of floride content.

Iron (Fe), Arsenic (As), Lead (Pb), Copper (Cu), and Zinc (Zn) are metallic minerals commonly found in minute quantities in water. However, only iron andarsenic have been found in reportable quantities in water samples from the Crow Reservation.

Boron (B) is an element necessary for plant growth in trace quantities. Different plants differ markedly in their tolerance to concentrations of Boron, and some plants may be injured when the concentration exceeds 1ppm in irrigation water.

Specific conductance is a measure of the ability of a solution to conduct electrical current. As the concentration of dissolved material increases, the electrical resistance of the water decreases and the specific conductance increases. While the actual ability of the water to conduct electricity is of no real significance in testing for water quality, the relationship between conductance and the content of dissolved solids does enable determination of the total amount of mineral matter in the sample.

Percent sodium is derived by dividing the sodium concentration in parts per million by the total concentration of calcium, magnesium, sodium, and potassium and multiplying the result by 100. The ratio is important in irrigation water since it affects the degree to which sodium will replace calcium and magnesium in the base-exchange complex of the soil. Excessive sodium causes soils to become relatively impermeable and difficult to till and irrigate properly. When combined with the carbonate radical, sodium can cause the soil condition known as "Black Alkali."

The chemical composition of primary bedrock aquifers on the Crow Reservation is summarized in general terms on the following page.

GROUND WATER MINERALIZATION ANALYSIS

Aquifer	Disolved solids in ppm	Percent of total Cations			Percent of total anions	
		Calcium	Magnesium	Sodium+K	Carbonate Bicarbonate	Sulfate
Parkman Sandstone	1,160	1.5	.1	98.4	43.5	54.1
Claggett (Cody) Shale	1,180	.8	.1	99.1	40.1	58.4
Claggett Shale	857	.4	.1	99.5	63.6	33.6
Cloverly formation	734	1.3	1.0	97.7	57.2	31.0
Undifferentiated	405	43.0	39.2	17.8	74.3	22.5

Souce U. S Geologica Survey

The Parkman Formation as it exists on the Crow Reservation is a 250 to 300 feet thick aquifer that is composed of interbedded sandstone and shale in the mountain areas and a basal sandstone along the Little Big Horn River valley. The aquifer is usually reached with wells from 100 to 210 feet deep with the water table established at plus or minus 11 feet. 600 to 20,000 gallons per day may be obtained from Parkman wells with domestic quality water usually obtained.

The Claggett Formation consists of about 500 feet of grey and brown shale, sandy shale, and sandstone. Yields from wells are generally low and in general the Claggett is not an important aquifer.

The Cloverly Formation produces a few wells on the reservation. The quality of water is excellent for domestic use, but unsuitable for irrigation due to the excessive sodium content. Most wells are from about 400 to 3500 feet deep, although the deeper wells are beyond economic drilling limits for water except where abandoned oil wells may be converted water wells. A 3365 foot well near Lodge Grass is used to irrigate hay fields, and although the water is unsuitable for irrigation in a technical sense, no ill effects have been observed.

The Fort Union Formation consists of beds of sandstone, shale, and coal having thicknesses up to 2,200 feet. A water bearing sandstone is penetrated at depths of 26 to 340 feet in reservation wells. Those that are drilled to coal beds usually produce potable water although it has a slightly brownish tinge. The generally impervious shale beds do not usually produce although when penetrated they give rise to following wells in structurally favorable areas. Usual yields are from 1-15 gpm of domestic quality water.

Madison Formation aquifers are the geologically oldest significant water bearing beds on the reservation. The formation consists of 700 to 1500 feet of grey to white and brown limestone which is characterized by caverns at the higher altitudes. Water from the Madison is usually hard but is suitable for continual irrigation of alfalfa on permeable, well drained soils due to its low saline content. However, it is generally unpotable due to a high calcium sulfate content. A 400 foot well (abandoned oil test) produces a flow of about 400 gallons per minute.

The Amsden Formation overlies the Madison with about 250 feet of sandstone, shale, and limestone with cavernous porosity. Generally good yields of up to 3700 gpm may be obtained although water quality deteriorates as wells move away from the parent Big Horn-Pryor Mountains. Strongly mineralized water may be expected except in the mountainous areas.

Tensleep Formation sandstones are capable of producing initial flows of 2000 gpm and sustained flows of 2000 gpm of slightly mineralized water. The aquifer consists of as much as 100 feet of sandstone and thin siltstone and limestone beds.

The Chugwater Formation is found in the lower part of the Big Horn valley and consists of 450 to 650 feet of sandstone and siltstone, an upper mantle of thin limestone, and thin gypsum beds.

Unconsolidated aquifers are generally found in the shales and with few exceptions are of poor quality because greater amounts of soluable minerals are available in the rocks, and the slower movement of water allows a longer period of contact between the water and the soluable minerals.

In summary, the ground water resources of the Crow Reservation may be described as extensive with wide variations in both quantity and quality. Water derived from bedrock aquifers is usually soft with a percent sodium greater than 95. Water from the unconsolidated deposits is generally hard with a percent sodium of less than 70. In addition, water from the unconsolidated deposits vary widely in both concentration and composition of dissolved salts.

Ground water in the unconsolidated deposits is derived from the infiltration of precipitation, irrigation water, canal seepage, and underflow from the uplands. Water from the wells in the vicinity of canals is similar in composition to the canal water. Water from older, higher terraces is generally more mineralized than that of the younger, lower terrace aquifers. The more mineralized water contains higher proportions of sulfate and sodium which may be caused by water inflow from adjacent formations or eroded material from these formations.

HISTORICAL AND ARCHEOLOGICAL SITES

The Crow Indian Reservation is rich in both recorded and unrecorded history and sites. Events such as the famous Custer Battle and the routes of the Bozeman Trail perhaps are the most significant of recorded history. On the unrecorded, or archeological side, many sites including vision quests, medicine rings, dinosaurs, and buffalo jumps are to be found. To aid in future planning and preservation of the remaining evidence the National Park Service has cataloged many of the known sites. A generalized synopsis of known sites follows:

1 & 2 Custer Battlefield and Reno Battlefield are located just south of Crow Agency and are the site where General Custer and his command of 265 men were eliminated by the Sioux-Cheyenne forces on June 25, 1876. Reno's command was pinned down at the second site following Custer's annihilation. Both Reno and Benteen were saved from a similar fate by the arrival of General Gibbon's infantry the following day. Six Crow scouts, Half Yellow Face, White Man Runs Him, Goes Ahead, Hairy Mocassin, White Swan, and Curley, were attached to the Custer command. However, none were with him on the hillside.

3. Baptist Mission Day School was opened in 1905 at Lodge Grass by Dr. W. A. Petzoldt. The first day school on the Reservation, it met with excellent response as the Crow much preferred the new approach to sending their children to boarding schools. The day school allowed the children to stay at home - often eight to ten miles from the school.

4. Battle of the Rosebud site is located just to the east of the present boundary near the junction of the North and South Forks of the Rosebud. The Fate of Custer was decided at this point since it was here that General Crook was defeated on June 17, 1876. His defeat prevented him from being in position a week later when Custer attacked the Sioux camp on the Little Big Horn.

5. Father DeSmet Cross is a cross of stones laid out on the ground near the Black Canyon Creek road west of Wyola. It was built to commemorate the activities of the Jesuit priest in the area.

6. John Blue Cabin is an isolated stone structure located just off of the lightly traveled road in John Blue Canyon, Wyoming. Blue came to the Big Horn Country soon after World War 1 and earned his living by trapping coyotes for this pelts. As a local character, he was representative of a vanishing way of life.

7. ML Ranch Headquarters is located off the reservation proper but is within the National Park Service Boundary for the Big Horn National Recreation Area, and as such, is of interest to the Crow as Master concessionaires for the recreation area. At the headquarters, about ¼ mile east of U. S. 14, four cottonwood log structures and corrals exist dating to the 1880's and 1890's. The ML Ranch is typical of the large cattle operations that were vital to the opening of the West to settlement.

8. The Kane Cemetary is all that remains of the town of Kane, Wyoming. Once the trading center of the Dryhead and Big Horn Country, the community was lost in the waters of the Big Horn reservoir. Site of the one regionally known Kane Ferry and the western terminus of the Dayton-Kane Road, the town has been survived by its cemetary.

9. Sykes Cabin and Graves are located near the Wyoming State Fish Hatchery on the southern end of the Big Horn National Recreation Area. The way of life of Frank Sykes as a hunter and trapper of the Big Horn Basin in the 1890's has become a part of the regional folklore. His cabin is still in good condition and the graves of his wife and child are marked and enclosed by a pole fence.

10. Hillsboro is located in Carbon County just a short distance from the road to Barry's Landing. The town has a post office, blacksmith shop, root cellar, log chicken house, log cabin, and a canned goods shelter in addition to the corrals and irrigation ditches of the Cedarvale Dude Ranch. The founder, Dr. G. William Barry, was the first man to exploit the recreation potential of Big Horn Canyon. The town was built about 1895 and shortly thereafter Dr. Barry used a power driven boat to navigate the Big Horn to show its wonders to the guests at his dude ranch.

11. Caroline Lockhart Ranch is on Davis Creek just east of the road to Dry Head. Built in the early 1900's the ranch house, outbuildings, and corrals are in an excellent state of preservation. Caroline Lockhart was a reporter, author, and editor from Illinois. While owner-editor of the Cody Enterprise she authored a number of novels at her Davis Creek Ranch. She was also at one time president of the Cody Stampede, which she helped organize.

12. Hole-in-the-Rock boasts two separate vision quest sites. Located at the natural bridge, from which the name is derived, about ½ mile north of the Carbon County Line, the two separate vision quest sites are about 50 feet apart. The site nearest the Big Horn Canyon has been vandalized in recent years but the second one appears to be undisturbed. The preserved site is described as an oval shaped enclosure of rocks that have been piled to a height of about one foot. From these sites one is able to view the beautiful Big Horn Canyon.

Vision quests were a requirement of the Tribe prior to attainment of warrior status. A boy approaching puberty must seek a vision to find his "medicine" - the spiritual aid to protect and help the plains warriors.

According to Crow historian Joe Medicine Crow, his grandfather, Medicine Crow, was revered by his people "as a visionary type of medicine man." Medicine Crow, on one of his vision quests, saw "something black with round legs puffing smoke and pulling box-like objects behind it coming down the valley of the Greasy Grass (Little Big Horn)." This was 30 years before the track of the Big Horn Southern Railroad reached Crow Agency in 1895.

13. The Dryhead Buffalo Jump is located at the junction of Dryhead and Hoodoo Canyons. The jump derived its name from the huge number of buffalo skulls piled up by the Crow. As the pile grew, the location came to be known as the place of Dry Skulls or Dry Heads. Today, the buffalo skulls from which the name is derived have been carried off, but the medicine stones may still be found. This jump differs from several others in the area since it lacks the V-shaped line of barrier rocks often used to guide the buffalo to the cliffs.

14. Dryhead Canyon Siege Site tells the interesting story of a battle between tribes. Located on the north rim of Dryhead Canyon, just west of Pitchfork Creek, the remains of a rock wall, tepee rings, breastworks, and the chips from arrowhead manufacture are evidence of the Indian against Indian fight. Since no Crow legends or tales tell of this fight, it must have taken place long before the white men arrived.

15. Hoodoo Creek Pictographs are located on the east side of Hoodoo Creek south of the dirt road to Dry Head Ranch. The pictograph is painted on the face of a rock overlooking the stream. According to Crow legend any person looking at the face that sees a frown will experience bad medicine and he will experience misfortune.

16. Pictograph Cave on Frozen Leg Canyon contains five separate picture panels that may be as much as 1000 years old. No interpretation has been made of the human and animal pictures and human-animal composits. Several of the figures have three fingered hands and many have horned headdresses. An anthropologist has found similarities to designs of the Salish tribes of Northwestern Montana.

17. Pretty Eagle Point Vision Quest site is located at the junction of Black Canyon and the Big Horn Canyon on the Northeastern Rimrock. Here, according to Crow Legend, Chief Pretty Eagle built the rock oval and laid down in it "and fasted until a pretty eagle spoke to him and gave him his medicine." With the proposed construction of a large motel complex near this site by the Crow Tribe, it will perhaps become the most well known of the numerous vision quest sites.

18. The Road to Oke-A-Beh was first established as a wood road and quarry road during the construction period of Fort C. F. Smith. The road has been well preserved by time and passes through the Backbone from Fort C. F. Smith to the quarry then up the west bank of Lime Kiln Creek to the Big Horn Mountains. The value of the limestone quarry was set by the army in 1879 when a Limestone Reservation was established to protect the resource. Stone from the quarry was used in construction of Fort Custer near the confluence of the Big Horn and Little Big Horn Rivers.

19. Fort C. F. Smith was the most isolated of the three forts the United States constructed to protect the miners and emigrants moving west over the Bozeman Trail. The construction of the forts and the traffic along the Bozeman Trail was one of the main treaty violations that caused the Sioux and the Cheyenne to vigorously resist the white advances. The Red Cloud War which ended with capitulation of the United States to the Indian demands, has been almost as forgotten by historians as the forts which were the cause. Mounds of earth and several significant depressions are the only remaining evidence of the cirra 1866 log and abode fort. The original fort, which was about 330 feet square was extensively pot-hunted during the construction period of nearby Yellowtail Dam.

20. The Fort Smith Medicine Wheel was constructed about 1850 by a Crow Indian named Scarface. As a child he fell into a firepit and was seriously burned. Recoiling from the taunts of the other children, he fled to the Big Horn Mountains. Taking up residence in a cave on what is now known as Medicine Mountain, Scarface built a huge medicine wheel. When found by his people and asked to rejoin them, he constructed the smaller wheel with only six spokes near the site of Fort C. F. Smith.

21. Hayfield Fight Site was the location where, on August 1, 1867, a small detachment of soldiers and armed civilians repulsed an attack by an overwhelming force of Sioux and other Indians. The precise location of the fight cannot be found today since the construction of the Big Horn Ditch has changed the general topography of the immediate area. The Hayfield Fight, like the Wagon Box Fight near Fort Phil Kearney the next day, was an army victory. In each case, the soldiers and civilians were armed with new breach-loading rifles, which they fired from behind barricades and inflicted such heavy losses on the redmen as to discourage attacks on the forts which was the attacking forces final objective. The site was located on the West side of War Man Creek, about 100 yards north of the Hardin to Yellowtail Dam Road.

22. Yellowtail Dam was named for Robert Yellowtail, a Crow Indian who served as Superintendent of the Reservation from October, 1934 to April, 1943. The concrete arch dam is 525 feet high and measures 1450 feet along its crest. The dam was completed in 1965 and presently serves to regulate spring runoff and provide electric power from its four 62,500 kw generators.

As has been stated by Indian historian, Ralph M. Shane, "much Crow history is ... documented only in the memories of the Tribe's official story tellers. To preserve their total history, we must also record their legends."

23. Big Horn Headgate was completed in 1893 and was constructed by Crows out of stone and mortar to control water flow in the Big Horn Ditch It was a major accomplishment connected with the massive irrigation project undertaken by the Crow in the 1890's and early 1900's. The diversion is located near the government housing project at Yellowtail Dam and was built to divert 720 cubic feet of water per second into the ditch. The headgate is 416 feet long and controls water capable of irrigating 35,000 acres.

24. Grapevine Buffalo Jumps were called "The place where men get their meat" by the Indians. These jumps are located on the Grapevine watershed and their extensive use is indicated by the number of jumps and the

relative good repair of the medicine stones leading to the cliffs. According to a noted Indian historian, more jumps were located in Montana than all the rest of the states combined. The prevalence of sandstone bluffs and numerous box canyons lends credence to the hypothesis.

25. Will James Studio is located on the East Fork of Pryor Creek on the present Schaak Ranch. The ranch was the setting for many James books of which "Smokey" is probably the most famous.

26. Pryor Gap was a sacred area of the Crow in their religious rituals. The Castle Rocks were a favorite site for vision quests. The last of many battles fought by the Crows in their "trap" occurred here about 1870. The Arapahoe war party was chased into the gap where an aspiring young chief, Medicine Crow, caught up with two invaders and pulled them to the ground when his horse was shot out from under him. The two were killed by other Crows. Wishing cairns are prevalent in the area.

27. St. Charles Mission just south of Pryor was built by the Jesuit Fathers shortly after completion of St. Xavier in 1887. This school-mission was received equally as well as evidenced by the fact that both still operate today.

28. Plenty Coups State Park was donated by Plenty Coups to commemorate the long friendly relationship between the Crow Tribe and the United States. Plenty Coups signed the deed over to Big Horn County on March 4, 1928. It was dedicated on August 8, 1928 with General Harbord accepting the 200 acre tract on behalf of the United States..

Plenty Coups was chosen to represent all the Indians of America at the grave of the Unknown Soldier in Arlington Cemetary on November 11, 1921. Although he could not speak English, the interpretation of his final words as he placed his war bonnet and coup stick on the grave brought tears to the eyes of many: "For the Indians of America I call upon the Great Spirit with gesture and chant and tribal tongue that the dead should not have died in vain, the war might end, that peace be purchased by the blood of redmen and white." When Plenty Coups died on March 3, 1932 he was buried under the cottonwoods near his home in the park. He was so respected by the Crow People that the headmen voted not to select a successor. "No living man could take the place of Plenty Coups." He died the last chief of the Crow.

29. Pryor Creek Battlefield is located on the west bank of that stream between the mouths of the East Fork and Hay Creek. At this site a combined force of Sioux, Cheyenne, and Arapahoe attempted to annihilate the Crow in May, 1866. The Crow, although outnumbered 20 to 1 managed to inflict heavy losses on the superior force and drive off their enemy.

30. Big Iron's Grave is located on the east bank of the Big Horn River about 3 miles south of St. Xavier. According to Crow legend, who Big Iron was his stepfather pushed him over a cliff into the Big Horn River. He was rescued by a Big Horn Ram and lived to a very old age.

31. St. Xavier Mission was the first Catholic Mission to be established on the reservation. John Keogh enrolled as the first student on Christmas, 1877. Under a cottonwood tree, part of which still stands on the Archie Willson Ranch near St. Xavier, Father DeSmet held his great mass in the Absaroka country in 1840 before the nearly 3000 Crows that had gathered. He envisioned a mission here but it was not until almost 50 years later that the mission was constructed under the direction of Father Prando, Father Barcello, and Father Grassi.

32. Fort Custer was constructed at the confluence of the Big Horn and Little Big Horn Rivers in 1887 to protect the frontier. Named after General George A. Custer, the garrison remained for 21 years but saw little military activity. Perhaps the establishment of the fort and other new garrisons discouraged further uprisings. It was near this location that the "Far West", the famous Missouri River Steamer, docked to take on the survivors of the Custer Battle and carry them to Fort Lincoln. The 920 miles trip was accomplished in 54 hours. It was aboard the Far West that General Custer, General Terry and Colonel Gibbon held their final council of war to suppress the Sioux-Cheyenne uprising. The plan did not work as the Sioux eliminated or defeated two of the three prongs involved in the plan.

33. Indian Caves State Park is south east of Billings near the Crow Reservation Boundary. The caves contain pictographs of early Indian periods on their walls. Several archeological expeditions to the caves have established use periods prior to the birth of Christ.

34. Sacrifice Cliff, just north of the Billings Fairgrounds, was employed by a few warriors who rode off the edge to appease the gods during the great smallpox epidemic. The epidemics in 1833, 1837, and 1851 reduced the Crow Nation from about 8000 to around 2000 members. The Indian sweat bath custom probably served to increase the number of fatalities.

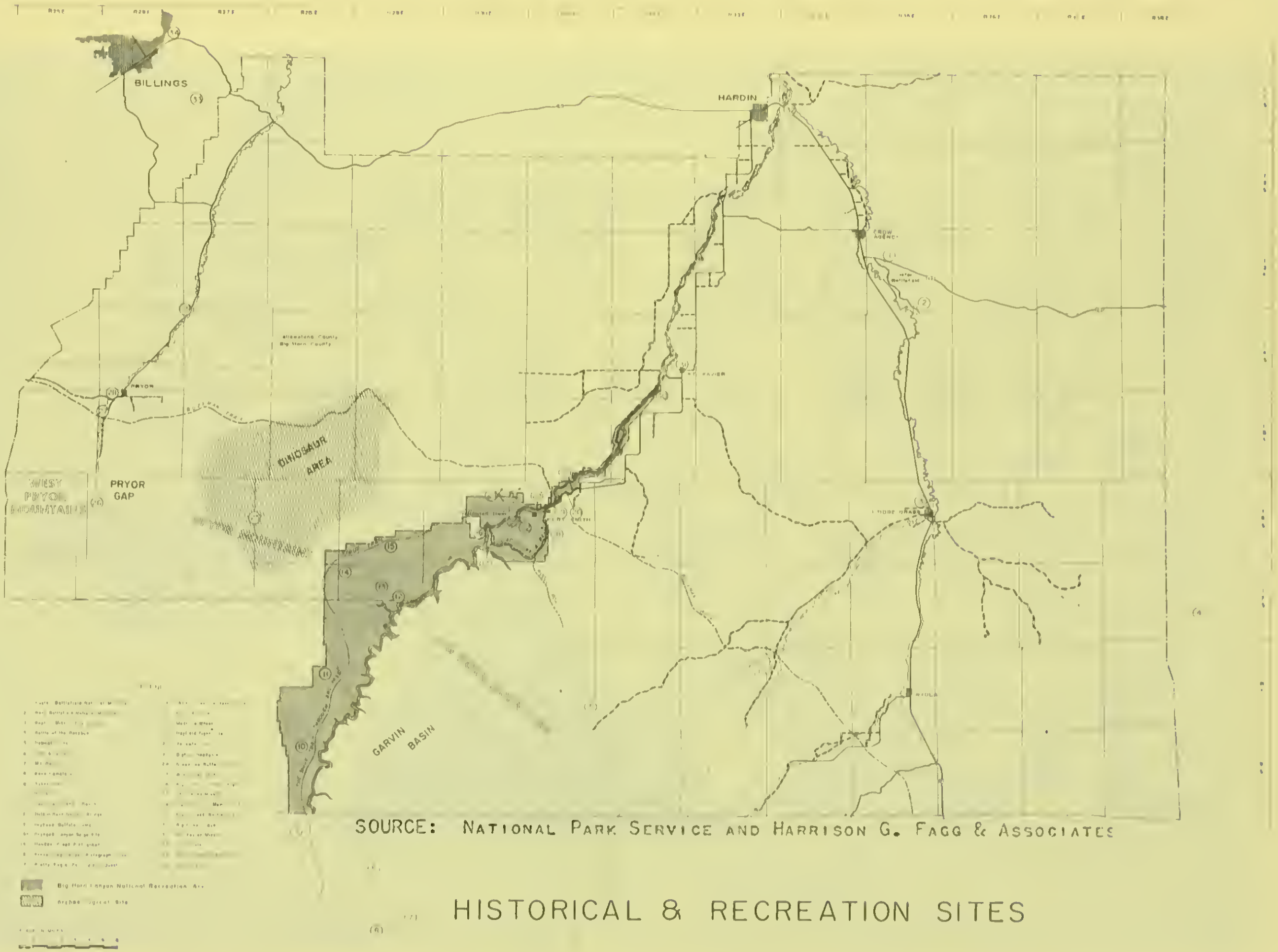
Dinosaur Sites on upper Beauvais Creek and in the Big Horn-Pryor Mountain areas have been recognized since 1882 as prime dinosaur hunting grounds. Recent finds in the area have been made in the Morrison Formation of the 140 million year old Jurassic Age. A dinosaur, known as camptosaurus, a bird footed, 15 to 20 foot long dinosaur of the iguanodantidae family was found in 1965.

The Sioux Trail was also known as Bad Pass and was used by Indians and trappers alike for trips between the Shoshone country and the Yellowstone River area. To mark the trail the men who used the path built cairns of rock at intermittent intervals -- many of which still exist. The trail is located on the West bank of the Big Horn Canyon and roughly follows the unimproved road to Barry's Landing.

The Bozeman Trail was one of the principal routes into Montana during the 1864-1866 era. The spot where the trail crossed the Big Horn near the site of Fort C. F. Smith is still evidenced by the century old wagon ruts on the steep grades and approaches to the Big Horn Crossing.

Garvin Basin was the site of the Samuel Garvin-Robert Lee cattle operation in the 1890's. They were caught with about 750 head of I. D. (Indian Department) cattle in their corrals. The cattle belonged to the Crow and the rustler's had affixed their mashed pumpkin brand over the I. D. The rustlers were sent to prison but the basin retains the name of one of them. It is located between Black Canyon and the Big Horn Canyon - a nearly unaccessable site.

Crow Agency is the last agency built for the Crow Nation' and is the



SOURCE: National Park Service and Harrison G. Fagg & Associates

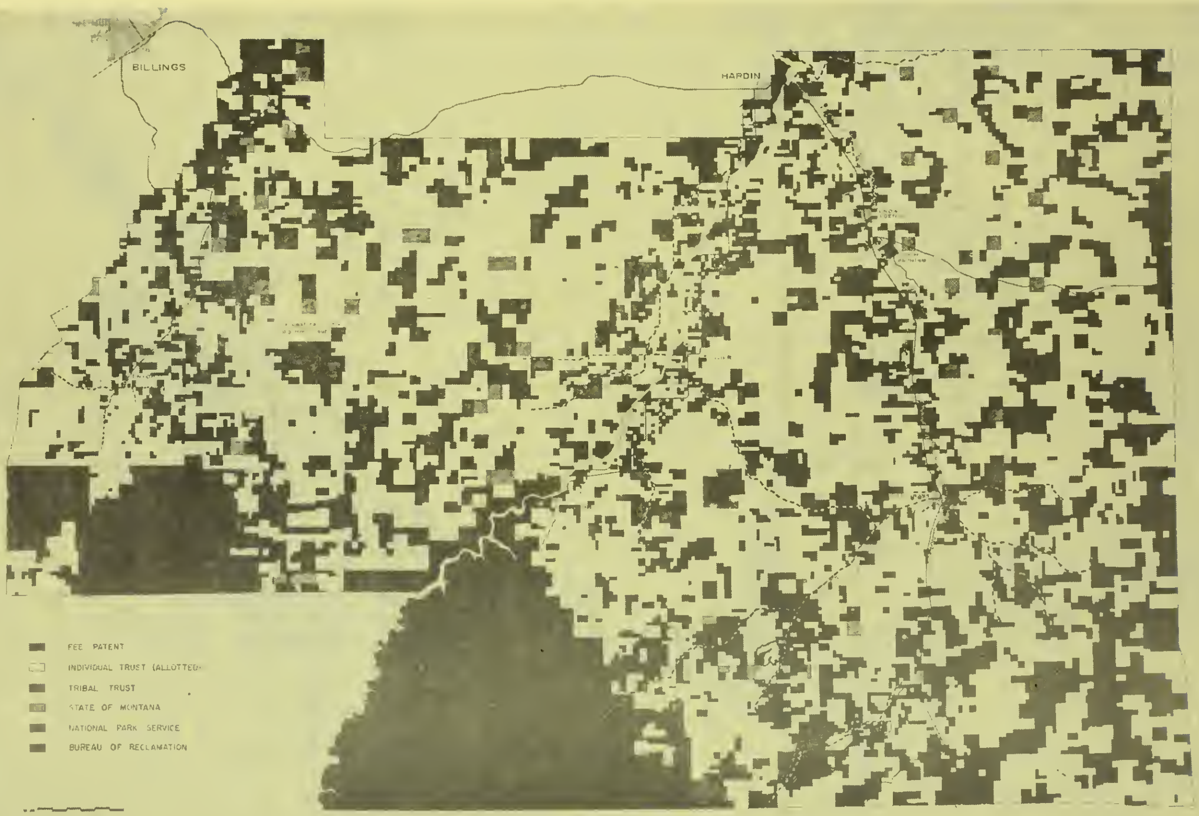
HISTORICAL & RECREATION SITES

present day center of activity for the reservation. The first agency was on the Missouri near the mouth of the Milk River. The second Agency was built about 8 miles east of Livingston near the mouth of Mission Creek as provided for in the Treaty of 1868. Fellows D. Pease was the first civilian agent appointed to serve the Crows. He remained with them from September. 1870 to July 1873. The first government school for the Crow was built in 1872 at Fort Parker near Livingston. Indian parents objected to sending their children to the school since the headmaster cut the student's hair – a sign of mourning among the Crow. The third agency was located between the East Rosebud River and Butcher Creek, about 4 miles south of Absarokee. This agency was occupied from 1875 until it was moved to the present site in 1884. The crows have an annual re-enactment of the Custer Battle at a site just south of Crow Agency.

LAND OWNERSHIP AND LAND USE

The Crow Indian Reservation by virtue of the Treaty of 1868 consisted of an area roughly encompassed by the Yellowstone River, the Montana-Wyoming state line, and the 107th meridian. As discussed in the first section of this report, the land area was reduced by a series of agreements that ceded land to the north and west of the present reservation. The last major cessions as ratified by Congress on April 27, 1904 involved lands from the Yellowstone River to the existing northern reservation border. Some of these ceded lands were withheld from sale to the settlers until the areas in question could be surveyed for mineral resources. The lands were classified as either mineral or non-mineral land with the titles being separated for those within the mineral classification. The surface right titles were sold to the settlers, and the sub-surface mineral rights being retained by the U. S. Government in trust for the Crow Tribe. The retention of these mineral rights is an important factor at the present time as exploration and leasing of coal reserve lands continues to become increasingly active.

Ownership of nearly all lands within the present Crow Indian Reservation may be separated into three major categories – fee patent, individual allotted, and tribal trust lands. Large, unsurveyed areas



LAND OWNERSHIP
CROW INDIAN RESERVATION, MONT.

SOURCE: Harrison G. Fagg & Associates

exist in the Pryor Mountains and Big Horn Mountain regions of the reservation, which causes large variances (up to 20,000 acres) to exist in the estimated total reservation acreage. The consultant has used protracted acreage figures developed by the Missouri River Basin Investigations to arrive at the total acreage used in this report.

The largest single ownership classification present on the reservation includes over 1,200,000 acres of individual allotted lands. The title to allotted lands is held in trust by the U. S. Government, but a patent in fee simple may be issued to the allottee at the discretion of the Secretary of the Interior to "competent" Indians. The Secretary, or his authorized representative has the power to declare an individual Indian as competent to manage his own affairs. Patents may also be issued to allotted lands by allowing the trust period to expire or through petition to the Secretary by a prospective purchaser for a negotiated sale. By act of Congress, the 45% of the Crow lands held in allotted trust status may have the trust period extended at the discretion of the President. This has occurred several times since the original allotments. Expiration or revocation of the trust period is resisted by most Indians since lands in fee patent or fee simple are subject to Montana and United States real estate laws including taxation.

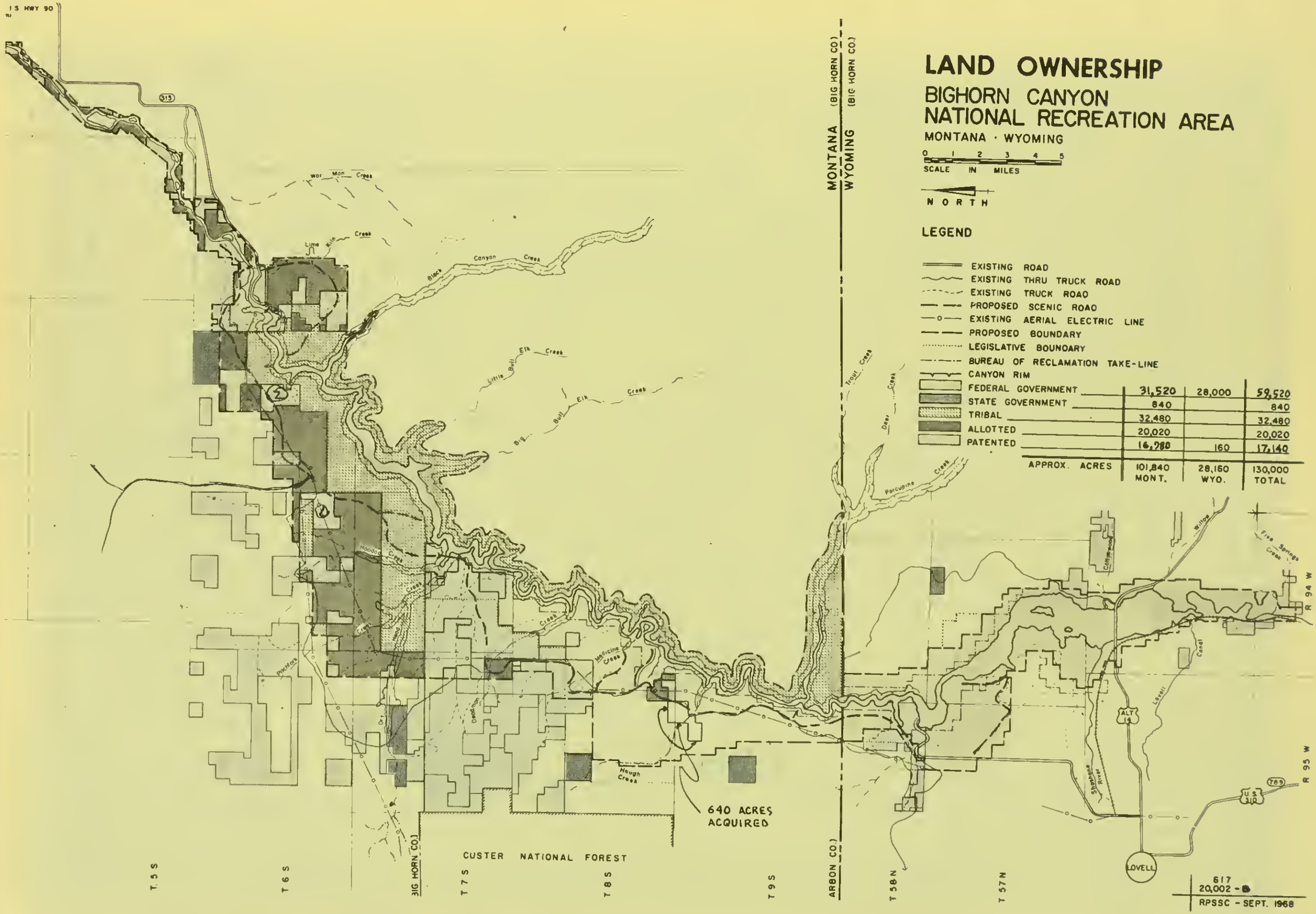
Nearly 30% of the reservation lands are presently in fee patent status. Part of these lands are held in fee simple by members of the Crow Tribe by virtue of allotments in severalty. However, there is no practical method of determining how much of the 664,000 acres of fee lands are owned by Crow Indian since records are not maintained by race after the patent is issued.

The last major land owner is the Crow Tribe. Some 339,000 acres were held in trust by the United States as of the end of the 1970 calendar year. These unallotted tribal lands have been reserved for the use and benefit of the tribe as whole. These lands are under the control of the Tribe and the Secretary of the Interior and leases or exploratory permits are usually reviewed by both prior to approval being granted. Within recent years the tribal lands have substantially increased as a result of the Crow land purchase program, under which the Tribe is purchasing much of the available individual trust lands before a patent is issued. A percentage of the income derived from the tribal lands is

LAND OWNERSHIP

BIGHORN CANYON NATIONAL RECREATION AREA

MONTANA · WYOMING



FEDERAL GOVERNMENT	31,520	28,000	59,520
STATE GOVERNMENT	840		840
TRIBAL	32,480		32,480
ALLOTTED	20,020		20,020
PATENTED	16,980	160	17,140
APPROX. ACRES	101,840 MONT.	28,160 WYO.	130,000 TOTAL

distributed among the tribal members in "per capita" payments. It is these payments that often create the false impression that the Indians are receiving a "paycheck" from the federal government.

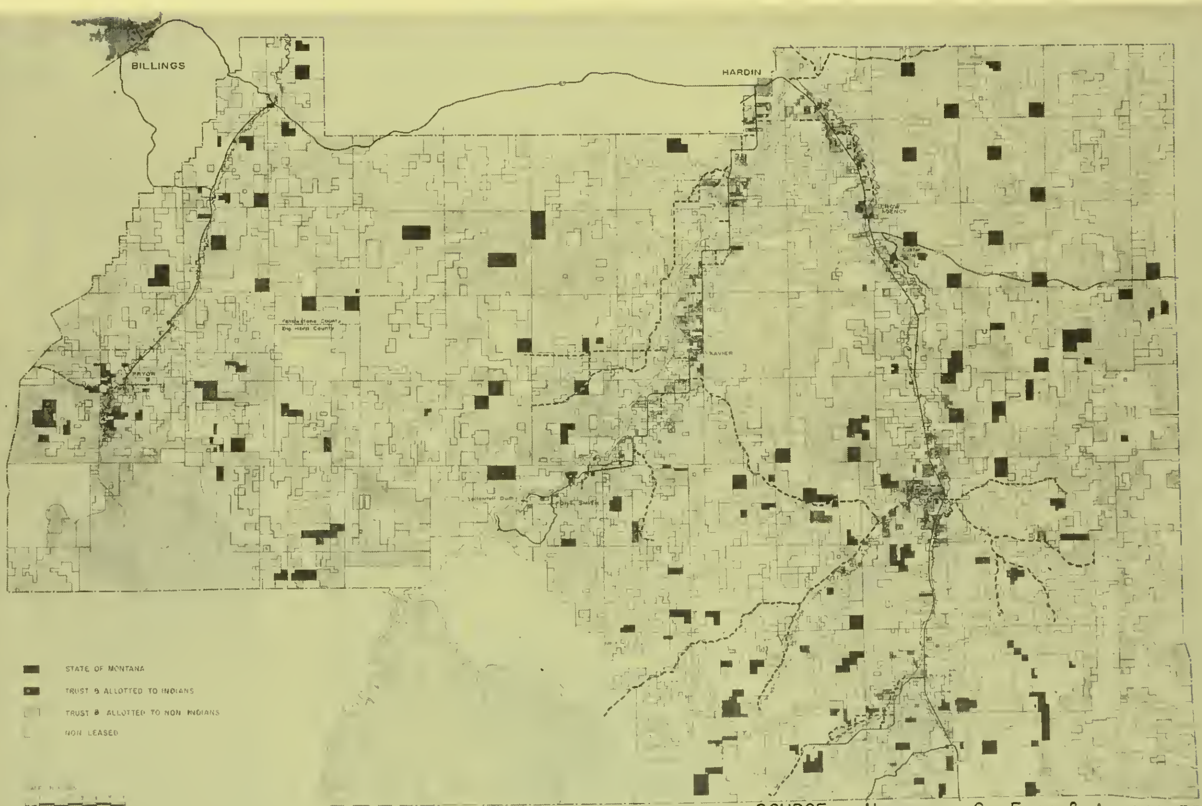
The ownership of other Crow lands is distributed among the several communities as well as the State of Montana and the United States. The State of Montana with about 36,000 acres is the largest governmental land holder. The majority of the U. S. lands are held by the Bureau of Reclamation in the Yellowtail Dam and Big Horn Reservoir developments. Other administering agencies include the Bureau of Indian Affairs (Willow Creek Reservoir and miscellaneous uses, and the National Park Service) Custer Battlefield and the Reno-Benteen Battlefield National Monuments. All of these agencies and their total acreage of ownership are presented in the following:

OWNERSHIP OF CROW INDIAN RESERVATION LANDS

TOWNSITES	339.23 acres
STATE OF MONTANA	35,873.24 acres
NATIONAL PARK SERVICE	765.38 acres
BUREAU OF INDIAN AFFAIRS	1,400.54 acres
BUREAU OF RECLAMATION	6,751.38 acres
FEE PATENT	663,753.19 acres
TRIBAL TRUST	339,438.30 acres
INDIVIDUAL ALLOTMENTS	1,221,784.24 acres
TOTAL CROW RESERVATION	2,270,165.94 acres

The Indian was left without his usual livlihood following the near extermination of the great buffalo herds by the hunters furnishing railroad crews with meat and the Easterners with buffalo hides and the much prized tongues of the beasts. But without the demands of the buffalo, the prairies thrived and soon their grasses were seen by the midwestern cattlemen as an ideal grazing land. Soon after the danger from Indian raids was past, the first permanent white settlers began to move in.

During the early 1880's the cattlemen began to drive their herds of Texas longhorns and Kansas scrub to the northern grasslands. The



SOURCE: HARRISON G. FAGG & ASSOCIATES

CROW RESERVATION LEASED LANDS

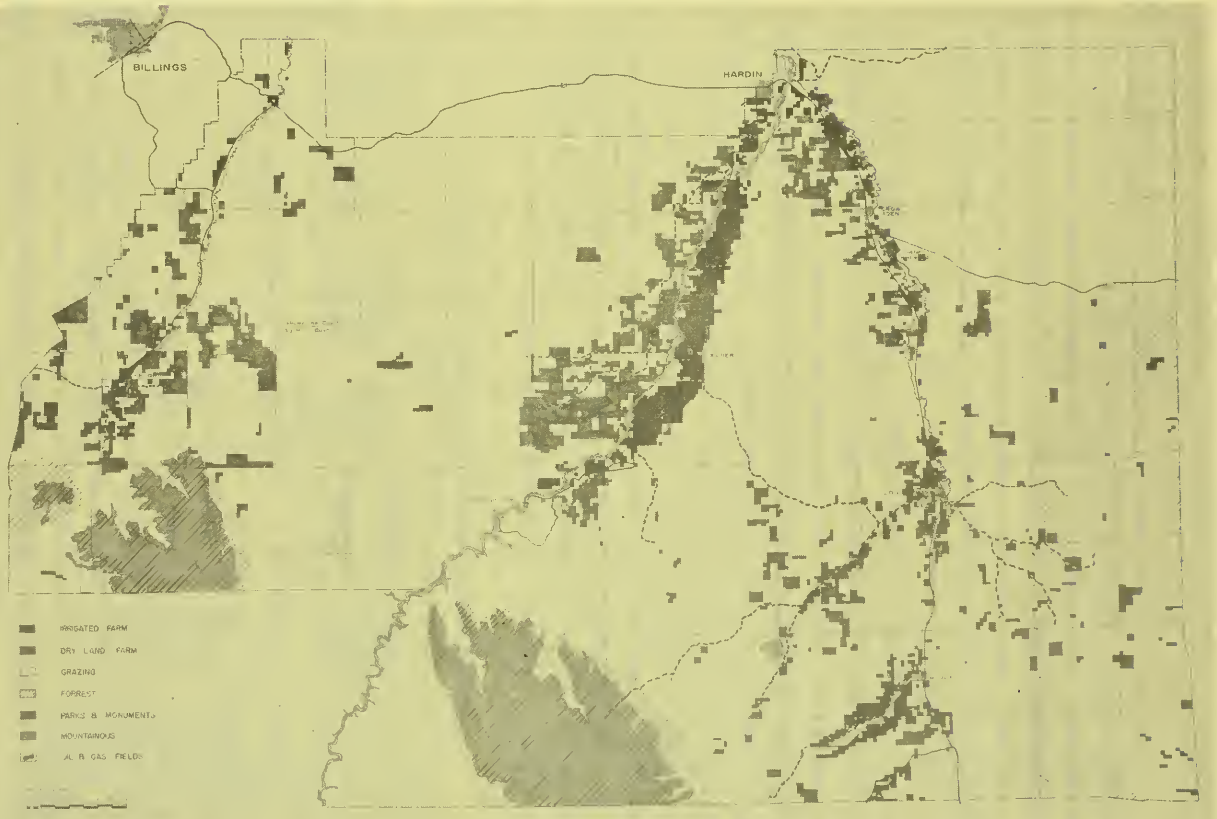
Early ranches were chiefly operated by the cattle companies with some herds exceeding 40,000 head. They established their headquarters in the Wyola and Lodge Grass areas adjacent to the Big Horn and Wolf Mountains. Despite strong resistance from the cattlemen, sheep raising had its beginning in the area in 1901 when large company owned flocks were brought in to graze. The open range, with both cattle and sheep grazing the lush grasses, continued to be the sole agricultural enterprise until 1906.

Although the Reno supply canal was constructed in 1885 to irrigate lands along the Little Big Horn River. The first crops grown under irrigation were primarily alfalfa and native hay for livestock which ranged throughout the valleys upland areas. The new irrigated area was relatively small and since dryland farming was generally considered impractical, some ranchers irrigated bottomland meadows by diverting river water onto them.

Within a few years of the 1904 land cession, the government opened the new area to homesteading and the land was taken up by settlers. The homesteaders came to the reservation when conditions were favorable and for a period of nearly ten years the crops were good. The large acreage they placed under dry farming methods produced good yields and the homesteaders prospered. In 1917, the great drought began and a series of poor crop years resulted in many failures and farms were abandoned. During the abandonment period, impetus was given to irrigation projects and the acreage under irrigated cultivation steadily increased in the valleys of the Big Horn and Little Big Horn Rivers.

CROW RESERVATION LEASED LANDS BY PREDOMINATE USE

LAND USE CLASSIFICATION	ALLOTTED	TRIBAL TRUST	U.S. GOVERNMENT	STATE OF MONTANA	TOTAL
Irrigation	17,375	420	81		17,876
Dry Farming	183,948	1,977	5		185,930
Grazing	839,685	126,532		38,873.24	1,005,110
TOTAL LEASED LANDS	1,041,008	128,949	86	38,873.24	1,208,916
TOTAL LANDS OWNED	1,221,784	339,438	8,918	38,873.24	1,609,013
PERCENT LEASED	85.2%	37.9%	0.9%	100%	75.1%



CROW RESERVATION EXISTING LAND USE

SOURCE: HARRISON G. FAGG & ASSOC.

After 1910 as the valley population increased, the size of the individual farm units became smaller. Alfalfa took larger and larger acreages and such crops as wheat, oats, and barley were produced for feed and for sale. Improved agricultural practices and the planting of drought-resistant varieties of grain made dry-farming practicable on the benchlands bordering the irrigated river bottoms, and wheat became the principal cash crop. Sugar beets were introduced to the area in about 1915 and within a few years became the principal crop. With the closure of the sugar refinery at Hardin, it appears that silage corn will become the main area crop.

Until recent years, few individual Indian land owners have had sufficient capital to make improvements to their holdings. As a result, over 90 percent of the individual allotted and tribally owned grazing and farm lands are leased to white farmers on a competative bid basis for periods ranging from five to twenty-five years - dependent upon the type of ownership and the type of land use. In recent years, the increase in owner-operated lands has resulted in growing demands for land management practices and additional irrigated lands. Governmental and tribal policies dominate the rental practices which produce a type of farm tenure that is not conductive to good soil management and tends to retard development of a stable farm population.

PREDOMINATE LAND USE -- CROW RESERVATION
By Type of Ownership

	U.S. GOVERN-MENT	STATE OF MONTANA	TRIBAL TRUST	INDIVI-DUAL AL-LOTMENTS	FEE PATENT	TOWN SITES	TOTAL
Wild Lands			9,732				9,732
Forest Lands	60		70,057	37,495	22,693		130,305
Parks & Recreation	765						765
Water Resources	6,700		850				7,550
Other Public Use	1,306		566				1,872
Irrigated Farm	81		720	18,037	22,709		41,547
Dry Land Farm	5		7,377	198,567	87,207		293,156
Grazing & Open Space		35,873	250,136	967,685	522,969		1,776,663
Townsites						399	399
Rights of Way					8,177		8,177
TOTAL	8,917	35,873	339,438	1,221,784	663,755	399	2,270,166

COMMUNITY FACILITIES

EDUCATIONAL FACILITIES AND PROGRAMS

The vast majority of Indian and non-Indian students from the Crow Reservation attend public schools located on or immediately adjacent to the reservation. Elementary schools are available at Crow Agency, Fort Smith, Lodge Grass, Pryor, St. Xavier, Wyola, and off-reservation at Hardin. Lodge Grass has the only on-reservation High School but students attend those of Hardin, Edgar, and in a few instances Billings. Some Indian students have been placed in Federal boarding schools.

A School Principals Association of all schools on the reservation was organized in 1965. During the school year the group meets monthly to discuss agenda items such as school attendance, curriculum coordination, student problems, and student transfers between school facilities. In order to facilitate better understanding of the probelms of Indian people and their children, the Bureau of Indian Affaris established a staff educational specialist to work with school superintendents, principals, counselors, and teachers of all schools on or near the reservation. This staff specialist is charged with the responsibility for development of programs to keep the Indian students in school for as long as possible. The net effect of these programs has been quite promising as school dropouts have decreased nearly 400 percent since their inception.

The receipt of over $12,000,000 in judgment funds for land cessions and right-of-ways has had probably the most marked effect on education on the reservation than any other single reason. Recognizing the importance of education, $200,000 of the 1968 judgment funds were programmed to this area. In addition, under the family plan program, education was one of the specified uses that the families were able to allocate their individual share to. The 1962 year, when the judgment fund programs were instituted, 28 Crow students graduated from high school and the dropout rate was about 47 percent. These indicators have progressively become more favorable each school year. During the 1968-1969 school year, total Indian enrollment increased to 1395 students, of which 264 were attending high school. The dropout rate has decreased to about 12 percent and the number of graduating seniors to 47.

The $200,000 in judgment funds was placed on deposit in the United States Treasury with the interest to be used for a college scholarship program. As a result college attendance has increased from 5 in 1969 to 128 in 1970. In 1969 the Crow Tribal Council appropriated $80,000 in funds for education. The trend towards better education is further evidenced by a study conducted in 1950 that indicated at that time there were 20 college graduates, 205 high school graduates, and 691 elementary school graduates. 160 adult Crow Indians could not read or write. Federally operated schools have not existed on the reservation since 1920.

School attendance has shown a definite trend for improvement although it appears enforcement of existing ordinances is difficult at best with the limited enforcement officers. Only one school district has a truant officer and it appears the other districts do not have sufficient capital to hire truancy personnel. The lone officer must patrol five schools that are spread over a 45 mile radius. The Bureau of Indian Affairs has attempted to aid in this area by requesting that the education specialist, juvenile officer, and welfare caseworkers assist the schools

FORECASTS OF SCHOOL AGE POPULATION AND ENROLLMENTS

Crow Reservation

AGE GROUP	1970		1980		1995	
	POPULATION	ENROLLMENT	POPULATION	ENROLLMENT	POPULATION	ENROLLMENT
6-14	1272	1234	1122	1099	1126	1103
6-20	2108	1686	2299	1954	2137	1923
6-22	2214	1750	2461	2059	2271	2023
14-20	836	452	1177	855	1011	820
14-22	942	516	1339	960	1145	920
20-22	106	64	162	105	134	100

SOURCE: Harrison G. Fagg and Associates estimate based upon present enrollment/population relationship and anticipated continuance of larger individual commitment to the educational process.

in combatting the problem. However, these additional personnel are handicapped by their regular duties and the reluctance of tribal judges to issue decisive orders. Suspended sentences are commonly given to the parents of the truant children.

In the summer of 1965, the Crow Tribe established a summer camp in Black Canyon in the Big Horn Mountains for students that need an extra boost to remain in school. During the first year of operation, 25 boys attended classes in remedial math, English, and art. Three hours were spent on scholastic improvement, four hours working on conservation projects, and the remainder devoted to leisure, competitive sports, reading, counseling with their instructors, or attending camp movies. The students are paid for the work performed.

The Youth Camp has expanded its facilities since the initial year of operation and it is planned that both boys and girls of Indian and non-Indian descent will be able to utilize the camp during the current 1971 summer. Plans are currently underway to winterize the living quarters and other buildings to enable a longer use season and possibly year around operation.

The survey of Crow Reservation residents indicated that the general populace feels the school programs, facilities, and staff on the Crow Reservation range from average to below average in quality. Aggregate quality rating of average was given for the various questions asked in this regard. Indian respondents tended to be a little more critical of the school situation on the reservation than were the non-Indian respondents. There was a considerable amount of "don't know" response expressed by the individuals interviewed. A far higher level of "don't know" response was expressed by the non-Indian individuals than by the Indians and, generally, the Indians were more candid in their response and expressed their opinions more freely. Overall, elementary schools were rated higher by the reservation residents than were the junior high and senior high programs, facilities, and equipment. Governmental assistance in the area of education was rated high. The non-Indian respondents, however, rated it higher overall than did the Indian respondents. In aggregate, the educational programs provided on the Crow Reservation were not rated as high as the educational building and educational equipment were. Likewise, teaching and administrative staffs were rated more comparably to the program than to the building and equipment

SUMMARY OF RESERVATION RESIDENT RESPONSES

TO SCHOOL RELATED QUESTIONS

Crow Reservation
1971

ALL RESPONDENTS

	Excellent	Good	Average	Below Average	Poor	Don't Know	Rank Score on 1 to 5 Scale
In general, the schools on the Reservation should be rated as	1.5%	15.5%	21.2%	17.7%	25.4%	18.7%	3.6%
Governmental assistance in the area of education is generally	6.4	15.8	37.4	12.6	6.0	21.8	3.0
The Teaching and Administrative Staff for Elementary Schools are	2.4	17.2	24.8	16.3	14.6	24.7	3.3
The Elementary School Programs are	2.3	17.5	25.8	15.9	13.0	25.6	3.3
The Elementary School buildings and equipment are	1.5	22.1	29.3	14.9	10.2	21.9	3.1
The Junior High School Teaching and Administrative Staff are	1.0	14.3	22.9	13.2	14.4	34.2	3.4
The Junior High School Educational Programs are	1.1	14.3	23.3	13.7	13.1	34.4	3.4
The Junior High School Buildings and equipment are	0.7	17.6	24.1	13.4	13.5	30.6	3.3
The Teaching and Administrative staff for high schools is	1.4	12.8	22.9	13.1	14.2	35.6	3.4
The High School Educational Programs are	1.4	12.6	23.5	13.7	13.7	35.1	3.4
The High School Buildings and equipment are	1.5	15.4	24.5	13.3	13.3	32.0	3.3
Extra Curricular Activities for High School Students are	1.1	12.3	19.2	14.9	15.3	37.2	3.5

INDIAN RESPONDENTS

	Excellent	Good	Average	Below Average	Poor	Don't Know	Rank Score on 1 to 5 Scale
In general, the schools on the Reservation should be rated as	1.9%	16.8%	22.9%	15.8%	31.6%	10.9%	3.7%
Governmental assistance in the areas of education is generally	9.5	13.9	40.6	18.6	8.6	8.8	3.0
The Teaching and Administration Staff in Elementary Schools are	1.9	16.8	22.9	15.8	31.6	10.9	3.7
The Elementary School Programs are	2.2	16.7	26.7	22.5	15.9	15.9	3.4
The Elementary School Buildings and Equipment are	1.2	20.4	29.2	20.6	12.3	16.2	3.3
The Junior High School Teaching and Administrative Staff are	0.7	15.0	23.8	18.4	16.2	25.8	3.5
The Junior High School Educational Programs are	0.7	14.5	25.1	17.7	15.0	26.8	3.4
The Junior High School Buildings and Equipment are	0.7	16.2	25.7	17.4	15.4	24.5	3.4
The Teaching and Administrative Staffs in High Schools are	1.7	13.2	24.0	18.1	16.2	26.7	3.5
The High School Educational Programs are	1.7	13.3	23.6	18.7	15.5	27.3	3.5
The High School Buildings and Equipment are	2.0	13.8	24.3	17.9	15.7	26.3	3.4
Extra curricular activities for High School Students are	1.5	12.6	22.2	18.0	17.7	28.1	3.5

Summary of Reservation Resident Responses to School Related Questions

Crow Reservation - 1971 (continued)

	Excellent	Good	Average	Below Average	Poor	Don't Know	Rank Score on 1 to 5 Scale
NON-INDIAN RESPONDENTS							
In general, the schools on the Reservation should be rated as	1.2%	14.5%	19.8%	19.2%	20.4%	25.0%	3.6%
Governmental assistance in the area of education is generally	3.8	17.3	34.8	7.8	4.0	32.4	2.9
The Teaching and Administrative Staff in Elementary Schools are	2.0	17.9	24.6	11.3	11.9	32.3	3.2
The Elementary School Programs are	2.4	18.1	25.0	10.5	10.5	33.4	3.1
The Elementary School Buildings and Equipment are	1.8	23.6	29.3	10.3	8.5	26.5	3.0
The Junior High School Teaching and Administrative Staff are	1.2	13.7	22.1	9.0	12.9	41.0	3.3
The Junior High School Educational Programs are	1.4	14.2	21.8	10.4	11.6	40.6	3.3
The Junior High School Buildings and equipment are	0.6	18.8	22.8	10.2	12.0	35.6	3.2
The Teaching and Administrative Staffs in High Schools are	1.2	12.4	22.0	9.0	12.6	42.8	3.3
The High School Educational Programs are	1.2	12.0	23.4	9.6	12.2	41.5	3.3
The High School Buildings and equipment are	1.2	16.7	24.7	9.4	11.2	36.7	3.2
The Extra Curricular activities for High School Students are	0.8	12.0	16.9	12.4	13.3	44.6	3.5

SOURCE: Harrison G. Fagg and Associates Survey of Reservation Respondents.

AVAILABLE. ELEMENTARY SCHOOL PROGRAMS WERE RATED SLIGHTLY HIGHER THAN THE JUNIOR OR SENIOR HIGH SCHOOL EDUCATIONAL PROGRAMS. LIKEWISE, ELEMENTARY SCHOOL STAFF WAS RATED SLIGHTLY BETTER THAN THAT AT THE JUNIOR OR SENIOR HIGH LEVELS. IT IS IMPORTANT TO NOTE THAT A RATHER LOW RATING OR POOR RESPONSE WAS GIVEN TO THE QUESTION CONCERNED WITH EXTRA-CURRICULAR ACTIVITIES FOR HIGH SCHOOL STUDENTS. INDIANS EXPRESSED A FAR LOWER LEVEL OF QUALITY FOR THESE ACTIVITIES THAN THE NON-INDIAN RESPONDENTS DID. IN REGARD TO THE GENERALIZATIONS ABOUT QUALITY, INDIANS AND NON-INDIANS WERE VERY SIMILAR IN THEIR RESPONSE INTER-RELATIONSHIPS. THE ABOVE TABLE CONTAINS DETAILS ON THE RESPONSES WHICH MAY PROVIDE INSIGHT INTO THE LOCAL ATTITUDES REGARDING EDUCATION QUESTIONS.

Inspite of the increased school attendance and better cooperation between Indian and non-Indian students in the public schools, the Indians still have not been able to overcome the language barrier that prevents their young people from reaching educational levels equal to their age group. Many Crow students do not have a command of the English language up to the time they enter school. In either written or spoken form the Crow tongue has no components similar to English. This factor causes a great deal of problems for the young student in maintaining studies. The educational lag appears to increase as the student passes from one grade to the next. Undoubtedly, this factor has contributed to the problem of Indian students leaving school prior to completion of the eighth grade or during high school years. Indications are that some inroads are being made into this area based upon the apparently substantial decrease in school dropouts in recent years.

On November 7, 1964, the Crow Tribal Council approved Resolution 65-5 which endorsed the purposes of the Federal Anti-Poverty Act and requested that programs provided for under the act be made available to all residents of the Crow Reservation so as to benefit the maximum number of people possible.

90 pre-school children from five communities participated in the first program approved for the reservation - "Headstart." It is anticipated the upcoming summer will see over 300 youngsters participating in the half-day classes. Instruction and supportive services are provided by both Indian and non-Indians at classes held in Crow Agency, Fort Smith, Lodge Grass, Pryor, St. Xavier, and Wyola. A director of remedial language arts is retained by the Community Action Program and is coordinating his activities with the schools. All of the students found to be in the lower achievement levels through testing of all enrolled students are given special assistance under this program.

The Tribe has in-school and out-of-school Neighborhood Youth Corps programs in operation. Both programs appear to be somewhat underfunded since the waiting lists are quite lengthy. Enrollees in the program are assigned to the National Park Service, Public Schools, Tribal Headquarter, the Bureau of Indian Affairs and the Public Health Service hsopital.

Special programs are usually run during the summer months and again the enrollment generally exceeds the openings. The wages earned by participants are used to purchase school supplies and clothes and to help at home.

Eastern Montana College in Billings conducts an Upward Bound program each summer. This program is designed to encourage high school students, from the sophomore level on up, to continue their education. The program has met with some success as about 80 percent of the first class of 26 in the summer of 1966 have enrolled in colleges and are continuing their education.

VISTA is active on the Crow Reservation and are assessed by the tribal and community leaders as a very effective group. VISTA workers are assigned to counseling NYC enrollees, teaching GED high school equivalency classes at night, working with PHS hospital candy stripers and working in the Child Care Clinic.

Each year the administration of the Community Action Program reassesses their position and plan for program expansion and improvement. To date, none of the programs conducted with Office of Economic Opportunity funding have been abandoned, and current planning calls for expansion of existing programming and the possible addition of new ones. It is to the credit of the reservation that the regional OEO office feels the Crow Reservation CAP to be a model program.

At the present time, school physical facilities on the reservation appear to be adequate to meet the needs of student enrollment. Some overcrowding exists in all of the schools servicing the reservation and lack of adequate funds necessitates deletion of some teaching aids and curriculum adjustment as well as postponement of minor to intermediate repairs. However, the conditions are not severe at the present time and it is anticipated that future expansion will take place in the larger communities, Crow Agency and Lodge Grass, to centralize facilities and enable the schools to provide more comprehensive education to a greater number of students. The possibility and feasibility of constructing a high school at Crow Agency should be investigated. However, with the termination of the Holly Sugar Plant at Hardin, and the subsequent departure of the plant employees, some slack should become evident in the school system. Thus, additional students from the reservation will be able to be accommodated.

LIBRARY FACILITIES

Each of the elementary schools on the reservation have libraries but they are limited in size and availability of resource material. In general terms, their use is restricted to student and school administration personnel. The high school at Lodge Grass has spent a good deal of time and effort in updating and expanding its library. Since beginning the program about five years ago, they have made substantial progress in updating the facility to better serve the student enrollment.

At Crow Agency, VISTA workers have established a small library of about 500 books in a small frame building provided by tribal officials. The books are on loan from the Billings Public Library but space limitation restricts the number of volumes to the present inventory, although the VISTA library is used to a certain extent by area school children but the largest single use volume is from young adults enrolled in evening high school equivalency classes.

The closest public libraries to the reservation are located at Hardin and Billings. The resources of the Billings Public Library are quite extensive and as a result they have developed a book mobile program that extends their service area to all reservation communities. Twice a month service to Crow Agency, Lodge Grass, Wyola, Fort Smith, St. Xavier and Pryor is maintained by the 3,000 volume book mobile. The service appears to be adequate as far as the smaller communities are concerned. However, Crow Agency and Lodge Grass should have expanded library facilities to allow greater exposure to the educational resources.

POLICE AND FIRE PROTECTION

The special officer of the Bureau of Indian Affairs Law and Order Branch is charged with the responsibility of supervising the Crow Reservation police force of nine members. The chief of police and the juvenile officer are provided by the BIA and the seven patrolmen by the Crow Tribe. Five radio equipped patrol cars are maintained by the force. One car and one policeman are stationed at Pryor with the remaining equipment and manpower located at Crow Agency. The latter are charged with the responsibility of patrolling all of the reservation with the exception of the Pryor drainage. The incorporated community of Lodge Grass retains a policeman for enforcement within the city limits.

Facilities for incarceration of law violators are located at Crow Agency and in Lodge Grass. The Lodge Grass city jail is in the basement of the city hall and contains two separate cells. The single cell is used for isolation of juvenile offenders with women gaining the second priority. Overcrowding of the single cell is not a common occurrance but it does happen on occasion--the largest number detained at one time numbered five persons. The larger cell is used as a tank facility and has a capacity of ten persons although 23 have been detained there at one time. The facility is somewhat dark and damp but not excessively so. It appears to be adequate for the limited demand.

The jail at Crow Agency although structurally sound has been condemned by both the Bureau of Indian Affairs and the Public Health Service as being a safety hazard and a health hazard. There are two cells in the jail with one reserved for men and the other for women and children. The men's cell tapes 12' x 20' and was originally constructed in 1939 to hold six prisoners. At the present time, approximately 60 percent of the floor space is taken up by the 14 bunks which have been placed in the room. Frequently the cell is occupied by 25 inmates and as high as 40 have been resident at one time.

The women's cell was designed to hold four prisoners in a 12' x 12' space. As many as 12 have been detained at one time. Although the state of cleanliness in the women's cell is somewhat better than that of the males, the general condition in both facilities is poor. The original paint on the concrete walls and floors has chipped off and cannot be kept clean. The concrete surfaces are deteriorating in places, thus, compounding the problem of sanitation. Overcrowding has caused damage to the utilities, electrical system, bunks, bedding, and the cubical surfaces. Exhaust fan ventilation is not adequate for the facility size. Lighting is accomplished by bare bulb fixtures that cannot be increased in candlepower due to inadequate wiring. There is not natural lighting in the jail. There is no privacy afforded to inmates using the shower, toilet or washbasin facilities which are crowded into a small space that is impractical and inappropriate in relation to the jail design.

The general floor plan is impractical for detaining men, women, or children. No separate facilities exist to detain juveniles separate from adult offenders. This creates additional problems among the inmates plus compounding the facility sanitation conditions.

The Bureau of Indian Affairs has initiated steps for construction of a new jail facility. Their plant management design branch in Albuquerque N. M. has drawn preliminary site and structure plans and made construction estimates of $500,000. The comprehensive improvement program if placed into action will result in substantially better imprisonment facilities. Preliminary plans include provisions for separate juvenile quarters, a detoxication center for alcoholic inmates, a half-way house and skill center for long term prisoners, and "in house" kitchen facilities to replace the present method of catering the prisoners food from a food service contractor. The proposal also provides for the tribal courtroom, judges chambers, clerk of court, probation office, chief of police, agency special officer, and supporting clerical staff--all of which are now located in the agency office.

Due to anticipation of construction of the new center, no major repairs have been made to the existing structure. Needed additions have not been constructed. Permanent repairs have been by-passed in favor of "make-do" repairs to plumbing, wiring, heating, and ventilation--all of which combine to further extend the net deterioration and increase the possibility of accident, sickness, and fire.

Fire protection facilities and equipment on the Crow Reservation are minimal. Crow Agency and Lodge Grass are the only locations that can boast of any resemblance of a fire department.

A volunteer fire department and a pumper truck serve the incorporated community of Lodge Grass. A relatively effective fire siren and back-up telephone system have proved to be effective under the infrequent action conditions. The equipment appears to be adequate to meet present and anticipated demand although an additional back-up unit and possibly more up to date basic equipment would be desirable. Technically limited to operation within the corporate limits the fire department has been known to respond to fires several miles from town.

The remainder of the reservation is under the protection of the Crow Agency based volunteer fire department.. Mainstay of the fire fighting equipment is a 1940's vintage pumper unit. Its use is confined to the water service area of Crow Agency since it must depend on hydrant connections to operate. Maximum output is 750 gallons per minute. The truck is maintained at regular intervals and has a full complement of hoses and emergency equipment sufficient for six firemen.

A second truck was purchased off the surplus market within the past few years. This truck and its pumping unit appear to be in relatively good repair. However, budgetary limitation have prevented the truck from being outfitted with hoses, nozzels, or other necessary emergency equipment. Two new trucks have been on request for several years and there is some prospect that one truck may become available during the upcoming 1972 fiscal year.

The Agency fire department is under the control of the BIA Plant Management Division. The head of the department doubles as siren signals and back-up telephone relays has proved effective under previous trials. The siren can be activated from three different locations.

In case of range fires or forest fires, the Bureau's Range Management branch maintains two tank trucks. One vehicle is a 1½ ton truck with a 500 gallon tank and the second is a two ton truck with a 1,000 gallon capacity. In addition, three 200 gallon tanks capable of being placed in a pick-up truck are on hand. County fire equipment located in Hardin and Billings is available for use on request of the respective areas of jurisdiction on the reservation. Neither agency was able to locate record of responding to on-reservation fire calls. Additional equipment and manpower is at least in theory available through the U. S. Forest Service and the U. S. Bureau of Land Management.

The Crow Reservation is able to boast one of the largest concentrations of firefighters in the nation. Over 300 trained personnel are residing within the boundaries. The great majority are either present day or former smoke-jumpers or forest fire crew members. The presence of these fire fighters could prove to be invaluable is emergency.

The greatest deficiency is in the antiquated and relatively ineffective fire equipment--particularly for rural residences or any major structures such as the carpet factory or motel complex south of Crow Agency. These facilities have, additionally, placed a severe strain on the Crow Agency water supply system that could result in a water shortage under not unlikely circumstance. Immediate corrective action is needed to assure adequate water--however, this is covered under another portion of this preliminary plan.

The majority of Crow Agency and the Sun Lodge complex near the Custer Battlefield have a fire rating of 8 which is a relatively good rating for a small community with a volunteer fire department. A small portion of the southern end of the reservation is rated as class 10--unprotected. As a comparative factor, the Hardin community has a fire rating of 6.

HOSPITALS AND HEALTH

The 34 bed Indian Health Service Hospital at Crow Agency is the only facility present on the Crow Indian Reservation. With the exception of extreme emergencies, care is limited to Indian people. All non-Indians must use hospitals at Sheridan, Hardin, or Billings. The IHS Hospital provides outpatient care for Crow people and inpatient services for residents of both the Crow Reservation and the Northern-Cheyenne Reservation. Out patient services are also provided at the Pryor Clinic.

A Community Health Services Department designed to promote health, health maintenance and disease prevention in families, groups, (school, Headstart, etc.), and communities has been in existence for four years. Environmental Health, Health Education, Public Health Nursing, Public Nutrition, Social Services, Dental Services and Community Medical Services are all handled through the CHS Department.

General medical and surgical hospitals in the general area are under contract for specialized care and hospitalization in addition to the general service provided at the Crow Hospital. Tuberculosis hospitalization and neuropsychiatric care are also provided on a contractual basis. The crippled children services of the Montana State Board of Health, Medicare and Medicaid through the Montana Social Security Commission, and Veterans Administration facilities at Sheridan, Wyoming and Miles City, Montana, and the vocational rehabilitation services of the Montana Board of Education are other hospital resources that are frequently used.

The Indian Health Service Hospital is fully staffed at all times. About 75 or 80 outpatients are treated each day. Some 250 patients are seen in the emergency room and about 100 patients are admitted each

CROW RESERVATION PHS INDIAN HOSPITAL STAFFING

	In Hospital	Field Service
MEDICAL STAFF		
Physicians	3	1
NURSING STAFF		
Nursing Director	2	
Head Nurse	1	
Registered Nurses (staff)	9	1
Psychiatric Nurse		1
Licensed Practical Nurses	7	
Nursing Assistants	5	
Psychologist		1
Mental Health Worker		1
LABORATORY		
Medical Technicians	3	
DIETARY		
Head Cook	2	
Cooks	3	
PHARMACY		
Pharmacists	2	
Pharmacy Technician	1	
ADMINISTRATIVE		
Administrative Officer	1	
Secretaries and Clerks	10	1
Service Unit Director	1	1
DENTAL		
Dental Officers		1
Dental Assistants		2
MAINTENANCE		
Building and Grounds Manager	2	
Maintenance Men	5	
Housekeepers	2	
Janitors	3	
Chauffer	1	
MISCELLANEOUS SKILLS		
Social Worker	1	1
Sanitation Technicians		1
Sanitation Aides		1
	64	13

month. An average of 21 inpatients constitute the daily patient load. The three physician medical staff makes its rounds of the patients each morning.

The nursing staff cares for all patients from admittance to discharge. During 1970, 1299 admissions, including new-borns were received, in addition to 1,633 at the Pryor Health Station. About 3,000 patients received emergency room treatment. The nursing staff responsible for patient care consists of a Nursing Director, an Assistant Nursing Director, a Head Nurse, nine RN's, seven LPN's, five Nursing assistants, and two temporary nurses.

Three laboratory technicians provide 24 hour serology, X-ray, urnalysis, bacteriology, and hemotology service to the hospital. Through chemistry, the laboratory can perform most tests utilized in detecting specific health problems. When multi-phase testing becomes necessary on occasion, the services of a contract laboratory are utilized.

Inpatient meals are prepared by a five member dietary staff. Nutritional consultants arrange the menu's and provide for the individual patient needs.

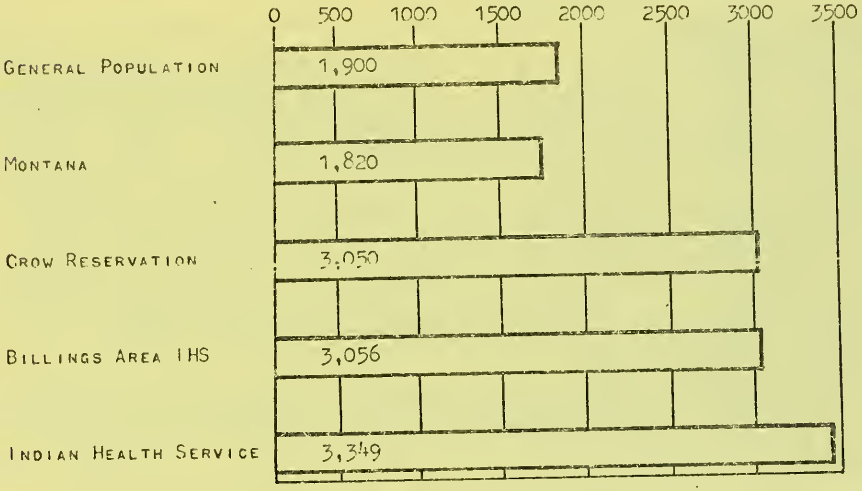
Two registered pharmacists and a pharmacy technician are responsible for providing the prescription needs of patients. The pharmacists make the daily patient rounds with the attending physicians and fill all prescriptions directly from the individual patient charts. Use and proper storage of medication is explained to the patients by a pharmacist prior to discharge.

The Crow Tribe has an active health, education, and welfare committee composed of six tribal members. This committee meets monthly with the hospital staff where information on policies and health care and disseminated to the committee. They in turn pass the information on to the people in their respective districts.

Dental Work on the Crow Reservation, like medical service, is limited to Indian patients. The dental staff, including a single dentist and two dental assistants, is charged with the responsibility of providing care to the 3,200 Indian residents plus any tribal members that live off reservation and drive to Crow Agency for their medical-dental needs. The present dental units statistics indicate that the dentist to patient ratio is about 1:3400 which compares to a general population ratio of about 1:1900.

Minimal dental services are available to the adult population. It is notoriously known by the Crow adult that the primary service available to them is emergency care--mainly the extraction of broken down decayed teeth and teeth afflicted with periodontal disease. During an average year less than 25 percent of the adult population will receive a dental examination--primarily due to lack of adequate treatment facilities.

DENTIST TO PATIENT RATIO



SOURCE: U. S. Public Health Service (IHS)

Among Crow children, about 100 will be able to have dental care during a given year under the present circumstances. An average of slightly less than five teeth per child will be found to be decayed and current service will enable less than half the located cavities to be filled. About 75 percent will require orthodontic treatment to correct crooked teeth. None will benefit. Five to ten percent will require a prosthetic unit to replace a missing tooth. Only one of every four will be able to be attended.

Dental diseases are nearly universal among the Indian people. Dental decay incidence is high, as is periodontal disease and tooth loss, even among Indians as a whole for Indians of the Crow Reservation.

The statistical evidence and the apparent lack of adequate care facilities indicates an expanded facility with additional staffing is needed—almost on an emergency basis. The need is not just to enable the known dental problems to be corrected, but to meet the needs of the remainder of the Crow population as well. Until this is accomplished, the dental program will continue to emphasize preventative treatment and perform dental care on emergency cases first with little time left for the remainder of cases.

RECREATION RESOURCES

The headquarters building of the Crow Tribe of Indians of Montana is a multi-purpose structure containing tribal executive offices, kitchen facilities, meeting rooms, a gymnasium, dressing rooms and showers. The gymnasium is used to a greater extent, by more people, than any other space on the reservation. In addition to casual use such as unorganized basketball, it is used for basketball and boxing tournaments, community dances, Saturday morning movies for the younger set, committee meetings, lectures and last but not least, as the meeting facility for General Council Meetings of the Crow Tribe.

Each of the other four on-reservation tribal districts has a district meeting hall that sustain many of the same uses as the main building at Crow Agency. These meeting halls are located at Pryor, Wyola, Lodge Grass, and St. Xavier. Black Lodge District at Hardin uses Crow Agency facilities. Sports activities are somewhat more limited in the small "roundhouse" meeting halls but they are not eliminated entirely. The general condition of the meeting halls is good to fair with the exception of the Pryor facility which has deteriorated over the years and is presently in very poor condition. The Fort Smith-Yellowtail complex is without a community building although the visitors center at the damsite has been known to allow small group meetings on occasion.

Recreation is important to all people, but among the Indians it has special significance. It is surprising in view of this fact that developed outdoor recreation facilities such as general use parks, playgrounds, wading pools, swimming pools, and so forth are conspicuous by their absence. This is not to say that dedicated parksites do not exist--for every townsite plot contains at least one park. However, there is a distinct difference between dedicated sites and developed parks. The extent of playground equipment is located in schoolyards and its use is generally restricted since much of it is stored during the summer months when the weather is the most compatible for its use.

One of the most popular sports on the reservation is hand games. This indoor sport is organized on the tribal district level and is unlimited as far as the number of team participants. A captain is selected from the team members and schedules are arranged so that each team plays each other one at least once during the season. Each Spring a reservation championship tournamemt is held with the previous championship team assuming the role of host. The intricacies of the game and the organizational work required are indicators of the capabilities of the tribe.

Bowling is a relatively popular sport although the lack of facilities limits the active team participants to those with personal transportation. Most bowling teams in the area are usually of mixed race composition, although the Bureau of Indian Affairs team is normally all Indian women.

The Hardin softball league usually has from 40 to 50 young men from the reservation on its teams. There are no all Indian teams but occasionlly a team will have nine Indian regulars. Every team has at least one Indian player.

Arrow throwing contests are quite popular among the Crow Indian young men. Contests are held in each of the tribal districts. The best two throwers from each district meet in a reservation wide arrow throwing contest to compete for the Crow Reservation Adult Championship and Junior Championship.

Young people of both sexes compete in a November through December volleyball league. The men's league and the women's league each have six teams with a high percentage of Indian membership. On occasion the women's league has been entirely Indian while the men's league seldom has over one-half of its teams composed of all Indian membership. Games are usually played in the tribal building gymnasium.

Among the younger people of the reservation, basketball is by far the most popular of team sports. Former high school and college basketball stars make up the playing rosters of several of the independent teams. Games are held throughout the reservation--usually in school gyms although the Crow Agency teams base their operations in the tribal facility. Teams from other reservations often enter in the annual tournament hosted by the Crow Tribe in their headquarters building.

Rodeo's are popular with area residents of all ages. Several men from the reservation compete in their specialties throughout the state and national rodeo circuits. The Crow Roping & Riding Club is composed entirely of rodeo performers. Another group of horsemen, the Reno Cowboys, has some rodeo competitors among its membership although a large percentage are more interested in the horseracing aspect. With completion of the concrete grandstand and sports arena about a mile south of Crow Agency, it is expected that interest and attendance at rodeos and horse races on the reservation will increase. The Crow Tribe annually hosts a fair and rodeo during the month of August that is attended by Indian people from throughout the nation, area residents of all races, and a number of tourists who are in the general vicinity. Some thought has been given to affiliating the rodeo with the Rodeo Cowboy Association to bring in "name" competitors.

General Custer and his men of the Seventh Cavalry meet their demise during the mid-summer production and staging of the Battle of the Little Big Horn close to the actual site of nearly a century ago. This is the Indians' interpretive viewpoint of the events leading up to and including Custer's ride into history. The first production of almost ten years ago was the Crow Tribe's first venture into the tourism business. After determining the first production of the outdoor drama was a historical, artistic, and financial success, it was decided to make the event an annual production--that would serve to promote the area, enhance the position of the tribe, and provide major tourist attraction. The second year, a non-profit corporation, Big Horn County Special Events, Inc. was formed to conduct the subsequent productions. The 25 member Board of Directors is composed of 13 Crow Indians and 12 non-Indian farmers, ranchers, and businessmen from the area. With the historical site is just a short distance from the reenactment scene, the tourists are, thus, able to view both the original battlefield and the theatrical representation of the event.

In 1967 a women's auxillary was formed to orgainze the wives and other women who had participated or aided in the reenactment. Concern was originally expressed by Indian and non-Indian directors that the women would not join--or if they joined they would not be active. The opinions of the board of directors could not have been more inaccurate. The women joined in numbers exceeding the men. They made Indian style vests of corduroy and felt that sold at a small profit and served to advertise the drama, and have proved to be invaluable aids in helping the young Indian riders with their costumes.

This Spring, construction was completed on a new 60 unit motel, tepee village, restaurant, and Indian Heritage Park near the Custer Battlefield National Memorial and immediately adjacent to the viewing grandstand and sports arena complex. Located at the junction of U. S. Highway 212 and Interstate 90, the tribally owned Sun Motel and Heritage Park complex is expected to open its doors to the public on about July 1.

The Crow Tribal Council originally declined to participate in the Big Horn National Recreation Area with the National Park Service. Discussions were held among tribal members on the benefits to be derived from participation and the obligations of the tribe if their trust lands were included in the recreation area. On October 15, 1966, Public Law 89-664 became effective establishing the Big Horn Canyon National Recreation Area and placing the following restrictions:

1. Crow Indian Tribal lands are prohibited from being included in the recreation area unless requested by the tribe. Additionally, the development of water based facilities by the tribe along the portion of the reservoir adjacent to the reservation is provided for as is the right of the Indians to hunt and fish on any reservation lands included in the recreation area.
2. The Secretary of the Interior is authorized to make boundary adjustments on the legislative boundary map.
3. A limit of $355,000 is set for land acquisition expenses within the legislative boundary.

In accord with the provisions of Public Law 89-664, the Crow Tribe and the National Park Service entered into an agreement on December 1, 1967 whereby the tribe agreed to make the lands within the boundary (proposed) available to be included in the National Recreation Area. These lands were to be for public recreation use including required administrative and recreational service facilities. In exchange for the lands the Crow Tribe is designated as master concessionaire for all facilities located on or adjacent to tribal lands and is given preferential opportunity to be concessionaire for the entire Montana portion of the recreation area.

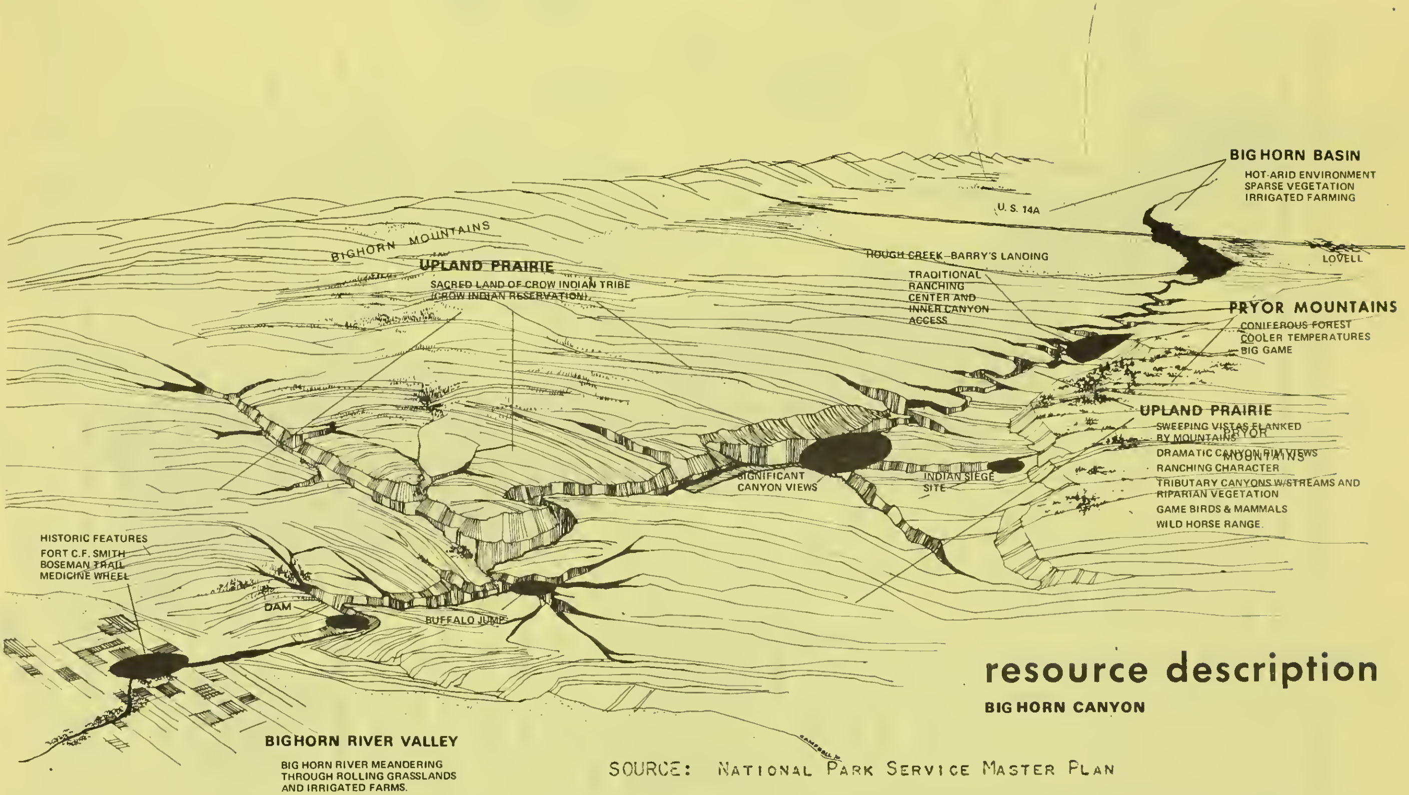
The National Park Service entered into other agreements with the Bureau of Reclamation, Bureau of Land Management, and the Wyoming Game and Fish Department. These agreements establish jurisdictional rights between the agencies and provide for local administration of adjacent public lands. Of interest to this study was the inclusion of a provision for a 7,000 acre wild horse range (BLM) and a 12,000 acre wildlife habitat (WG&F).

The Big Horn Canyon National Recreation Area is presently overshadowed by other National Park facilities within the general region such as The Black Hills, Glacier National Park, Teton National Park and Yellowstone National Park. This is not to say that Big Horn Canyon does not have potential, for its reservoir under proper development will provide ample water based recreation for the people of the surrounding upper Great Plains Area, as well as a spectacular and rewarding trip for the tourist and casual traveler.

The major east-west thoroughfare, Interstate 90, should provide the bulk of the tourist traffic. Visitors from the upper midwest and those leaving the Black Hills will generally take this route on their way to Yellowstone or Glacier. At the present time another east-west route, U. S. 14-A which passes through the southern end of the recreation area near Lovell, and U. S. 312 which terminates at Fort Smith, provide the only direct paved access to the Big Horn Canyon. Although a paved scenic road is eventually planned to traverse the entire west side of the reservoir, only one leg on the southern end has construction underway. The remainder of the north-south access is only by way of unimproved jeep trails. No access exists or is planned to the eastern side with the exception of the road to Pretty Eagle Point and Oke-A-Beh.

resource description

BIG HORN CANYON



SOURCE: NATIONAL PARK SERVICE MASTER PLAN

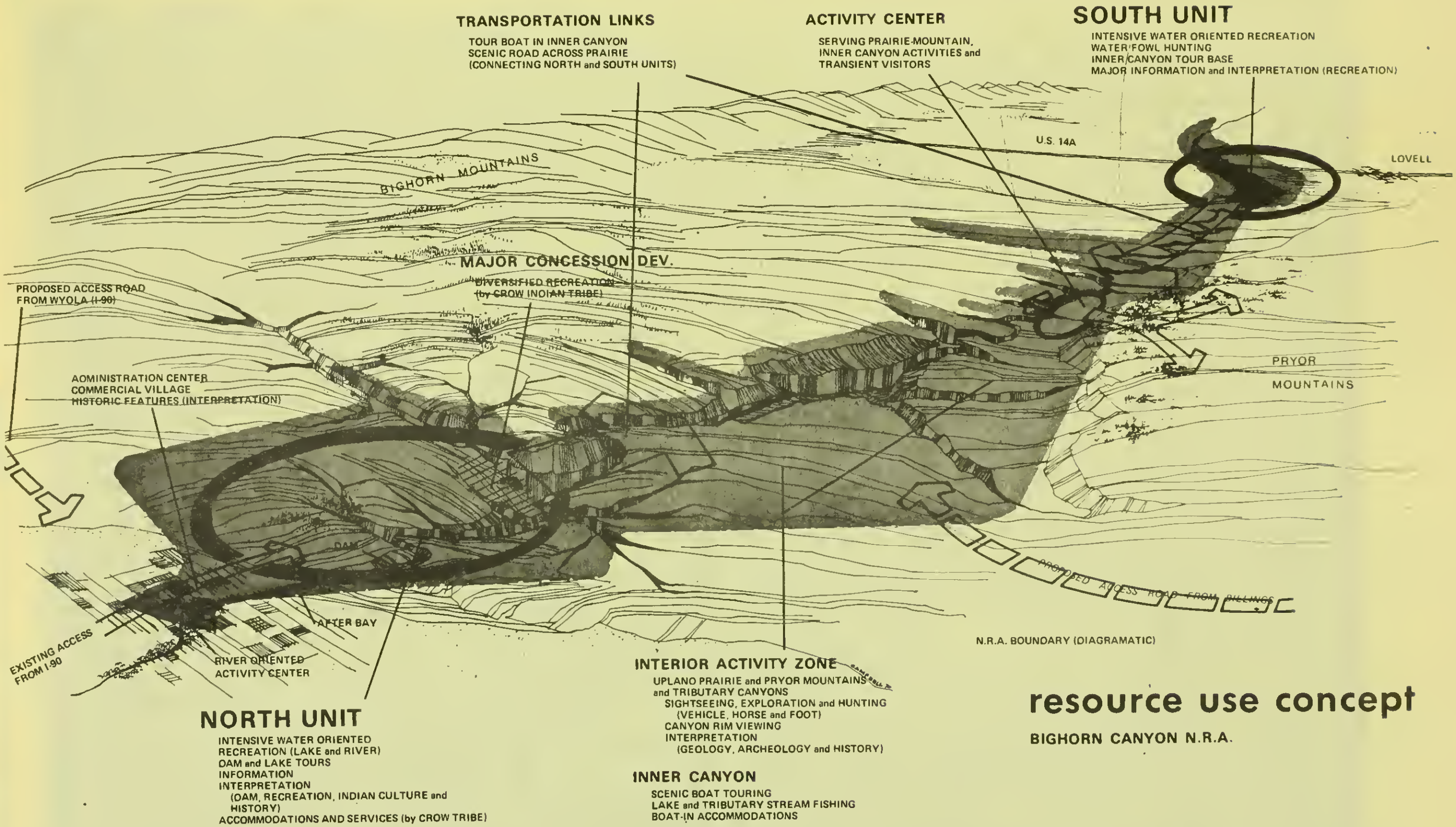
According to the National Park Service master plan, "One of the basic objectives of this plan is to enrich the recreation experience by capitalizing on the surrounding Crow Indian culture and the atmosphere of a bygone ranching era."

In this manner NPS is attempting to place the majority of commercial development at, or close to, the extreme ends of the recreation area. The intervening area will be a more leisurely natural area. The north end of the area, in which this report is primarily concerned will, because of its very nature, become somewhat of a combination between the leisure and the commercial. This end of the lake is surrounded by nearly vertical rock cliffs which are topped by rolling grasslands making a breathtaking spectacular. Indian culture is present in the form of buffalo jumps, vision quests, medicine wheels, and so forth.

At the present time development on the north end has been limited to dam construction, the government village, a visitors center at the damsite, an improved road to Pretty Eagle Point and Oke-A-Beh, and minor boating facilities on the west shore. Design standards and final composition of the marina at Oke-A-Beh are presently under review although launching facilities are essentially complete. It is hoped this facility will be available for public use in the summer of 1972.

The development priorities for the Big Horn National Recreation Area as established by the National Park Service in order of priority are:

1. Development of Oke-A-Beh boat ramp, access road, parking area, and other required facilities to make the north end of the lake available for public use; and the complete development of Horseshoe Bend.
2. Completion of Pretty Eagle and the Oke-A-Beh marina developments as provided in the concession contract with the Crow Tribe.
3. Complete road section from Horseshoe Bend to Barrys Landing and a spur to Devils Canyon overlook.
4. Complete Barrys Landing development and the access road.
5. Complete through road from Barrys Landing to Fort Smith and a spur to Eye-of-the-Eagle overlook.
6. Complete Hough Creek development plans


TRANSPORTATION LINKS
TOUR BOAT IN INNER CANYON
SCENIC ROAD ACROSS PRAIRIE
(CONNECTING NORTH and SOUTH UNITS)
ACTIVITY CENTER
SERVING PRAIRIE-MOUNTAIN,
INNER CANYON ACTIVITIES and
TRANSIENT VISITORS
SOUTH UNIT
INTENSIVE WATER ORIENTED RECREATION
WATER FOWL HUNTING
INNER CANYON TOUR BASE
MAJOR INFORMATION and INTERPRETATION (RECREATION)
U.S. 14A
LOVELL
BIGHORN MOUNTAINS
MAJOR CONCESSION DEV.
DIVERSIFIED RECREATION
(by CROW INDIAN TRIBE)
PROPOSED ACCESS ROAD
FROM WYOLA (I-90)
ADMINISTRATION CENTER
COMMERCIAL VILLAGE
HISTORIC FEATURES (INTERPRETATION)
PRYOR
MOUNTAINS
DAM
AFTER BAY
EXISTING ACCESS
FROM I-90
RIVER ORIENTED
ACTIVITY CENTER
PROPOSED ACCESS ROAD FROM BILLINGS
N.R.A. BOUNDARY (DIAGRAMATIC)
NORTH UNIT
INTENSIVE WATER ORIENTED
RECREATION (LAKE and RIVER)
DAM and LAKE TOURS
INFORMATION
INTERPRETATION
(DAM, RECREATION, INDIAN CULTURE and
HISTORY)
ACCOMMODATIONS AND SERVICES (by CROW TRIBE)
INTERIOR ACTIVITY ZONE
UPLAND PRAIRIE and PRYOR MOUNTAINS
and TRIBUTARY CANYONS
SIGHTSEEING, EXPLORATION and HUNTING
(VEHICLE, HORSE and FOOT)
CANYON RIM VIEWING
INTERPRETATION
(GEOLOGY, ARCHEOLOGY and HISTORY)
INNER CANYON
SCENIC BOAT TOURING
LAKE and TRIBUTARY STREAM FISHING
BOAT-IN ACCOMMODATIONS

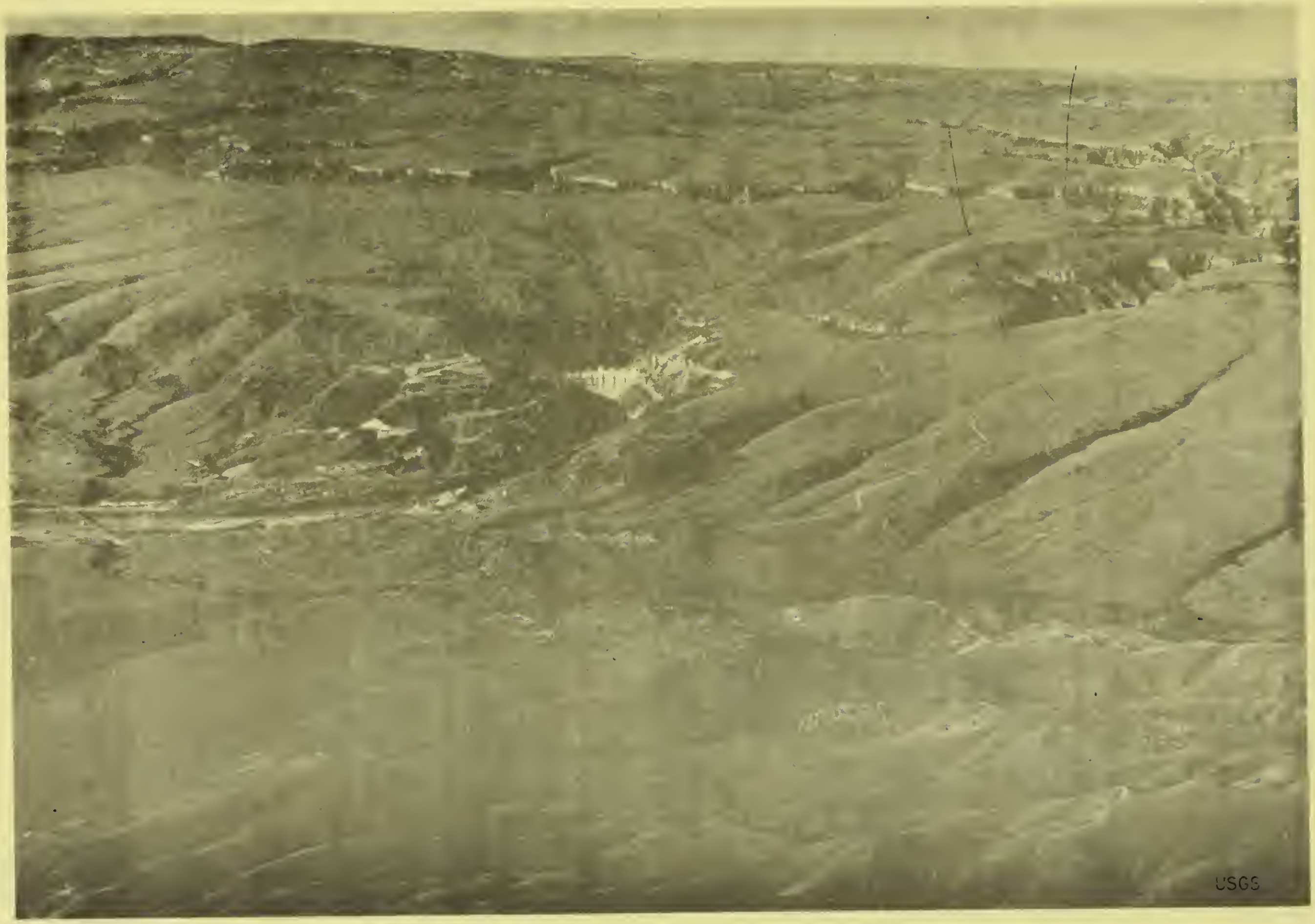
resource use concept

BIGHORN CANYON N.R.A.

SOURCE: NATIONAL PARK SERVICE MASTER PLAN

7. Develop Big Horn River Campgrounds, picnic areas, and river access.
8. Develop on reservoir boat in camps, navigational aids, sanitation stations and other needed facilities.
9. Develop Medicine Creek according to plans.
10. Improve present Afterbay airstrip or relocate to a new site.
11. Complete Big Horn River site development.
12. Develop interpretive devices as permitted by completion of research and road and trail construction.
13. Add concession development as indicated by demand.
14. Construct Administrative Headquarters after analysis of site alternative.
15. Develop Chugwater area.
16. Develop hiking and motor trails.
17. Expand developments as space permits and demand indicates.

As previously stated the Oke-A-Beh boat ramp, access road, and parking area as contained in NPS priority 1 are substantially complete. Site work and road paving were accomplished during the 1970 summer. Construction of the supporting marina with its docking and storage facilities is close to commencement according to tribal sources. Access to Oke-A-Beh is gained by either the 12 miles of road from Fort Smith or by boat over approximately a mile of water from the damsite. Other plans in the area are included in priority 2; the completion of a 150-200 unit motel complex at Pretty Eagle Point which is to include a restaurant and lounge, coffee shop, gift shop, theatre, game rooms, viewing and relaxation areas, swimming pool, sauna bath, tennis courts, field games area, and possibly a golf course. In addition facilities for pick-up campers, trailer campers, and tent campers are planned to complete the Pretty Eagle Complex. With completion of the road connecting the south to the north end of the recreation area the 180,000 area of visitors of 1967 is expected to jump to over 800,000 by 1977 and over 2,000,000 within the planning period. During the past season (1970), slightly less than 500,000 tourists and area residents visited the Big Horn National Recreation Area.


USGS

THE RUGGED BIG HORN CANYON CAN BE TRACED IN THE ABOVE PHOTO AS IT COURSES SOUTHWARD TOWARD WYOMING BEHIND YELLOWTAIL DAM.

Recreation on Big Horn Lake and the surrounding area is not limited to commercial development as far as the Crow Reservation is concerned. Streams throughout the reservation provide good to excellent fishing. With the successful plant of 8,000,000 trouts fingerlings to Big Horn Lake in 1967 the potential of the reservoir was set. By 1969, the Montana Fish & Game Department had re-classified the lower lake to a Blue Ribbon Stream designation. Catches of over five pounds per fish are not uncommon. The Crow Tribe has relaxed restriction against fishing and bird hunting on the reservation to non-Indians provided a tribal permit is purchased.

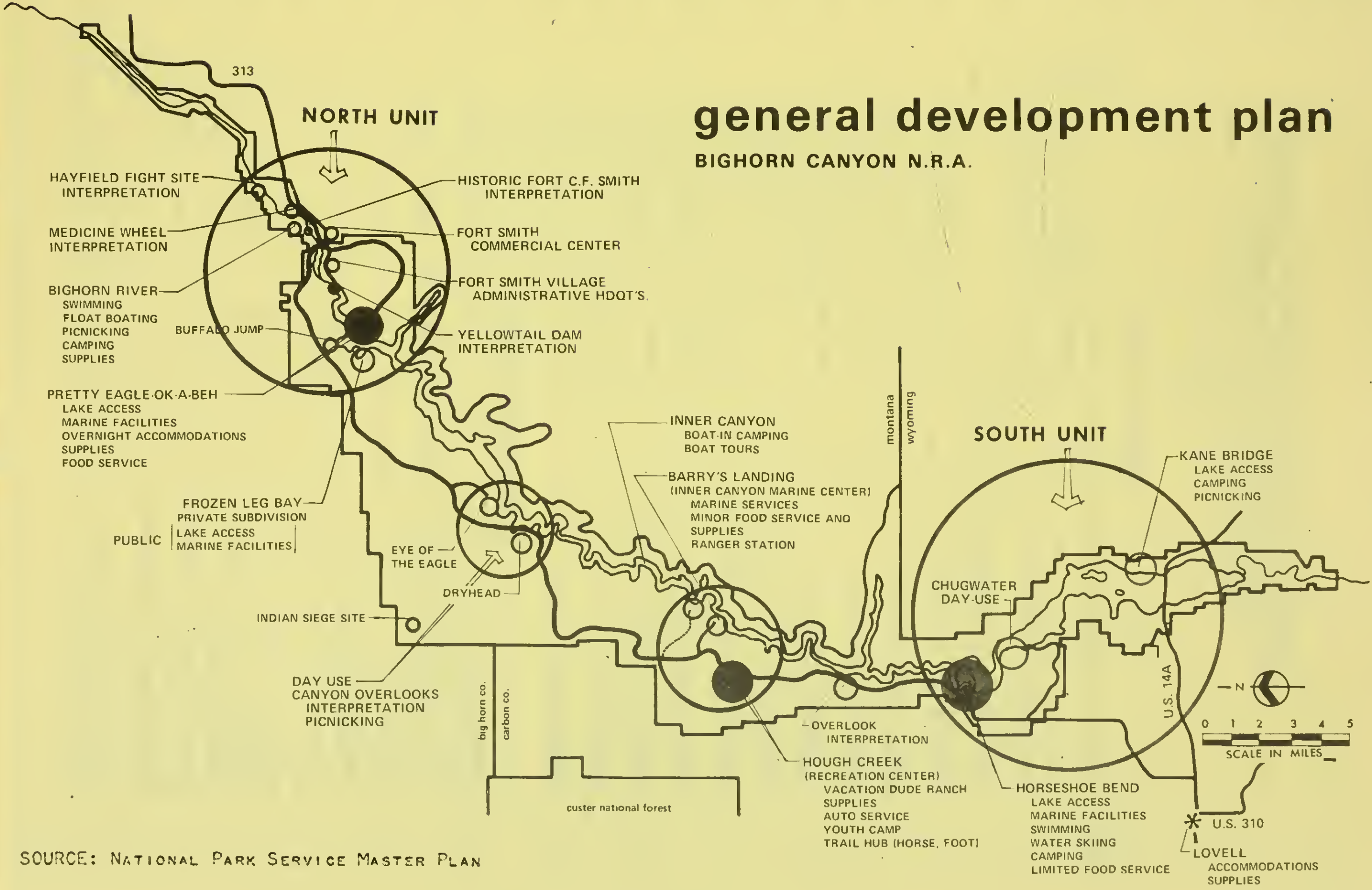
Birds of the area range from prairie sage grouse to exotics such as the Hungarian Partridge. Pheasants are plentiful as are migratory waterfowl. The reservoir is on the Central Flyway and has become a favored nesting, resting, and feeding habitat for mallard, pintail, teal, and geese. With final development of the 12,000 acre habitat management area near Horseshoe Bend migratory waterfowl populations should substantially increase.

Although hunting by non-Indians is limited to upland game birds and waterfowl, other game is plentiful in the area. Species include black bear, muskrat, beaver, mink, coyotes, prairie dogs, and numerous other small prairie animals. With the improvement of habitat, species not now found should be able to be favorably re-introduced. A substantial elk herd roams the Big Horn Mountains area and many tribal members supplement their larders from its resources. A small elk herd has been transplanted to the Pryor Mountain side of the canyon. Deer and antelope are less plentiful but still exist in large numbers. A buffalo herd is in the process of being re-established after decimation by disease a few years ago.

Interviews with residents of the Crow Reservation indicated that limited recreational opportunities and facilities were available for their use and that those available were of poor quality. Indian respondents rated opportunities and facilities poor more frequently than did the non-Indian respondents. However, very few non-Indian respondents rated any of the facilities excellent. Among the types of facilities present,

general development plan

BIGHORN CANYON N.R.A.


313
NORTH UNIT
HAYFIELD FIGHT SITE INTERPRETATION
MEDICINE WHEEL INTERPRETATION
BIGHORN RIVER SWIMMING FLOAT BOATING PICNICKING CAMPING SUPPLIES
BUFFALO JUMP
PRETTY EAGLE-OK-A-BEH LAKE ACCESS MARINE FACILITIES OVERNIGHT ACCOMMODATIONS SUPPLIES FOOD SERVICE
HISTORIC FORT C.F. SMITH INTERPRETATION
FORT SMITH COMMERCIAL CENTER
FORT SMITH VILLAGE ADMINISTRATIVE HDQT'S.
YELLOWTAIL DAM INTERPRETATION
FROZEN LEG BAY PRIVATE SUBDIVISION
PUBLIC LAKE ACCESS MARINE FACILITIES
EYE OF THE EAGLE
DRYHEAD
INDIAN SIEGE SITE
DAY USE CANYON OVERLOOKS INTERPRETATION PICNICKING
big horn co.
carbon co.
custer national forest
INNER CANYON BOAT-IN CAMPING BOAT TOURS
BARRY'S LANDING (INNER CANYON MARINE CENTER) MARINE SERVICES MINOR FOOD SERVICE AND SUPPLIES RANGER STATION
montana
wyoming
OVERLOOK INTERPRETATION
HOUGH CREEK (RECREATION CENTER) VACATION DUDE RANCH SUPPLIES AUTO SERVICE YOUTH CAMP TRAIL HUB (HORSE, FOOT)
SOUTH UNIT
CHUGWATER DAY-USE
KANE BRIDGE LAKE ACCESS CAMPING PICNICKING
HORSESHOE BEND LAKE ACCESS MARINE FACILITIES SWIMMING WATER SKIING CAMPING LIMITED FOOD SERVICE
U.S. 14A
U.S. 310
LOVELL ACCOMMODATIONS SUPPLIES
N
0 1 2 3 4 5
SCALE IN MILES

SOURCE: NATIONAL PARK SERVICE MASTER PLAN

SUMMARY OF RESERVATION RESIDENT RESPONSES TO RECREATION RELATED QUESTIONS

Crow Reservation
1971

ALL RESIDENT RESPONDENTS

	Excellent	Good	Average	Below Average	Poor	Don't Know	Rank Score on 1 to 5 Scale
General Recreation Opportunities for Children are	0.2%	4.9%	7.4%	8.0%	65.4%	14.1%	4.6
General Recreation Opportunities for Teenagers are	0.2	3.2	6.9	5.8	69.5	14.5	4.7
General Recreation Opportunities for Adults are	0.2	2.8	8.2	7.0	67.5	14.3	4.6
General Recreation Opportunities for Senior Citizens are	0.3	2.0	4.7	6.1	70.9	16.0	4.7
Wading Pool Facilities for Children are	0.1	1.4	1.5	2.4	72.8	21.7	4.9
Swimming Pool Facilities for Young and Old are	0.3	0.9	1.4	2.5	73.4	21.5	4.9
Playground Facilities throughout the Reservation are	0.4	6.8	7.6	14.4	52.4	18.4	4.4
Sports Field Facilities throughout the Reservation are	0.6	4.0	11.8	17.9	16.2	19.5	4.3
Park and Picnic Facilities throughout the Reservation are	1.3	23.0	19.4	17.4	25.8	13.0	3.5
Teenage Center Facilities throughout the Reservation are	0.7	1.2	3.1	9.3	63.4	22.4	4.7
Cultural Opportunities on the Reservation are	0.4	5.2	10.9	20.1	35.1	28.3	4.2
Library Facilities on the Reservation are	1.6	13.4	8.9	26.9	31.9	17.3	3.9

INDIAN RESIDENT RESPONDENTS

	Excellent	Good	Average	Below Average	Poor	Don't Know	Rank Score on 1 to 5 Scale
General Recreation Opportunities for Children are	0.5%	3.7%	6.6%	7.8%	72.2%	9.3%	4.6
General Recreation Opportunities for Teenagers are	0.5	1.9	6.3	5.6	75.4	10.2	4.7
General Recreation Opportunities for Adults are	0.5	2.4	6.3	8.3	72.3	10.2	4.7
General Recreation Opportunities for Senior Citizens are	0.7	1.5	3.2	6.8	76.0	11.7	4.8
Wading Pool Facilities for Children are	0.2	1.0	0.7	2.5	74.9	20.6	4.9
Swimming Pool Facilities for Young and Old are	0.7	0.7	0.2	2.7	74.5	21.1	4.9
Playground Facilities throughout the Reservation are	0.7	8.8	6.1	13.2	59.3	12.0	4.4
Sports Field Facilities throughout the Reservation are	1.2	4.0	12.6	18.6	51.0	12.6	4.3
Park and Picnic Facilities throughout the Reservation are	1.7	26.5	14.6	20.2	28.7	8.3	3.5
Teenage Center Facilities throughout the Reservation are	1.0	1.0	2.5	10.1	68.3	17.2	4.7

Summary of Reservation Resident Responses To Recreation Related Questions

Crow Reservation - 1971 (continued)

	Excellent	Good	Average	Below Average	Poor	Don't Know	Rank Score on 1 to 5 Scale
Cultural Opportunities throughout the Reservation are	1.0%	8.2%	12.6%	20.3%	37.4%	20.5%	4.1%
Library Facilities throughout the Reservation are	2.2	15.6	8.6	29.1	34.1	10.4	3.9
NON-INDIAN RESIDENT RESPONDENTS							
General Recreation Opportunities for Children are	0.0%	5.9%	8.1%	8.1%	59.9%	18.0%	4.5%
General Recreation Opportunities for Teenagers are	0.0	4.2	7.3	5.9	64.6	18.0	4.6
General Recreation Opportunities for Adults are	0.0	3.2	9.7	5.9	63.6	17.6	4.6
General Recreation Opportunities for Senior Citizens are	0.0	2.4	5.9	5.5	66.8	19.4	4.7
Wading Pool Facilities for Children are	0.0	1.8	2.2	2.4	71.0	22.6	4.8
Swimming Pool Facilities for Young and Old are	0.0	1.0	2.4	2.4	72.5	21.8	4.9
Playground Facilities throughout the Reservation are	0.2	5.2	8.8	15.3	46.8	23.7	4.4
Sports Field Facilities throughout the Reservation are	0.0	4.0	11.2	17.3	42.4	25.1	4.3
Park and Picnic Facilities throughout the Reservation are	1.0	20.2	23.3	15.2	23.5	16.8	3.5
Teenage Center Facilities throughout the Reservation are	0.4	1.4	3.6	8.6	59.5	26.5	4.7
Cultural Opportunities throughout the Reservation are	0.0	2.8	9.5	19.9	33.2	34.6	4.3
Library Facilities throughout the Reservation are	1.2	11.7	9.1	25.1	30.1	22.8	3.9

SOURCE: Harrison G. Fagg and Associates Survey of Reservation Residents.

the only one rated with any reasonable degree of quality was the park and picnic facilities throughout the reservation. One can see from examination of Table that seven of the categories rated aggregate poor response on a one to five scale and only five categories rated a below average. This below average rating was the highest aggregate score received by any type of recreational facility or opportunity.

Provision of adequate recreation facilities to accommodate the needs of reservation residents should be an important part of the reservation's comprehensive plan. The level of facilities required on the Crow Reservation are primarily those relating to the home locations of their users.

The reservation has considerable opportunity for outdoor recreation. In the larger designated area, hunting, fishing, and other outdoor type activities are generally available for Indian and non-Indian, alike. The local problem arises due to a lack of playground, sports field, and related facilities for children and adults in their organized and informal play.

Neighborhood recreation facilities should be considered for each community in one of three possible types. Their distribution, as well as the amount of land designated to this purpose, are important considerations. The National Recreation Association has classified these three types as the playlot, the neighborhood playground, and the play field. Each type fulfills a specific function and should be located in the community in response to local needs.

Playlots, the first category of alternative forms of local recreational facilities, are primarily for pre-school age children. They serve the same function as backyards and should be developed in residential areas. Collectively, however, they can provide a certain level of recreational opportunity for youngsters; an opportunity which is in the reservation towns. If the community neighborhoods are laid out in such a way as to provide adequate open space around homes and if the street system is designed to discourage or eliminate through traffic, the need for playlots may be limited. However, in the developed portions of reservation communities and attendant to the development of low cost housing, the playlot can assume an important function. Under these circumstances, one playlot should be available for each 30 to 60 family group. Thus, in a reservation town of 1,000 people, three playlots would be an appropriate number.

The size of each playlot should range from 1,500 to 2,500 feet in area and each one should be located in direct view of all the houses it serves.

If a playlot is further than a few blocks from the house it serves or if it is located near a busy traffic street, the area of the playlot should be increased to 2,000 to 4,000 square feet.

Playlots should be equipped with such devises as low swings, slides, sandboxes, jungle gyms, space for running, and circle games. A portion of the lot should be paved to provide a hard play surface. All play equipment should be designed and arranged for small children and consideration should be given to provision of low walls, logs, tubes, shallow trenches, or small hills for imaginative and creative play by the youngsters it serves. Some form of enclosure, such as a hedge, may be desirable and benches, for the benefit of mothers supervising their children should be included in the area.

The second major type of local recreation facility is the neighborhood playground. Such a park-type facility is primarily intended for children between the ages of six to fourteen, but becomes the center of recreation activities for the community. An acceptable location standard for playground development would be within ¼ mile walking distance of each house served. Where particularly large lots are involved, the distance served by a playground could cover a ½ mile distance. The preferable location for a playground is adjacent to a community center or an elementary school where supervised play is possible.

As a rule, one playground operating for fewer than 200 children or more than 1,200 is impractical. By this standard, each reservation town would probably require one playground. A minimum size of three acres for a 400 child playground is recommended and, as the number of children increases, the size of the playground should increase accordingly. As a general rule, one additional acre of playground space should be provided for each additional 200 children over and above the original 400 children.

The playground should provide an area for appartus and open-space for informal play. Courts for games such as softball, tennis, hardball, and volleyball should be available. Space is also needed for quiet activities such as crafts, dramatics, and story-telling. If desired by the particular community, a wading pool would be an asset to the playground. The playground area should also contain shelter and rest areas for the adults and lighting to allow evening use. In light of economical factors, it is often impractical to substitute a number of small play spaces for

TABLE E-3

STANDARDS FOR RECREATIONAL ACTIVITIES

A. Standards for Recreational Activities

Type of Recreational Activity	Space Requirements for Activity Per Population	Ideal Size of Space Required for Activity	Recreational Area Wherein Activity May be Located
Active Recreation			
1. Children's Play Area (with equipment)	0.5 acre/1,000 pop.	1 acre	Playgrounds-Neighborhood Parks Community Parks, School Playgrounds
2. Field Play Areas for Young Children	1.5 acres/1,000 pop.	3 acres	Playgrounds-Neighborhood Parks Community Parks
3. Older Children-Adult Field sports Activities	1.5 acres/1,000 pop.	15 acres	Playfield-Community Park District Park
4. Tennis-Outdoor Basketball Other Court Sports	1.0 acres/5,000 pop.	2 acres	Playfield-Community Park
5. Swimming	1 outdoor pool/25,000	Competition size plus wading pool 2 acres	Playfield-Community Park
6. Major Boating Activities	100 acres/50,000	100 acres and over	District Park-Regional Park or Reservation
7. Hiking-Camping-Horseback Riding-Nature Study	10 acres/1,000 pop	500-1,000 acres	Large District Park-Regional Park
8. Golfing	1-18 hole course per 50,000 pop.	120 acres	Community Park-District Park
Passive Recreation			
1. Picnicking	4 acres/1,000 pop.	varies	All parks
2. Passive Water Sports Fishing-Rowing Canoeing	1 Lake or Lagoon per 25,000 pop.	20 acre water area	Community Park Special Regional Reservations
3. Zoos, Heritage Parks Botanical Gardens	1 acre/1,000 pop.	100 acres	Large District Park or Special Facility
Other			
1. Parking at Recreational Areas	1 acre/1,000 pop.	varies	Playfields, Community, District & Regional Parks
2. Indoor Recreation Center	1 acre/10,000 pop.	1-2 acres	Community Parks
3. Outdoor Theaters, Band Shells	1 acre/25,000 pop.	5 acres	District Parks

(Continued)

STANDARDS FOR RECREATIONAL ACTIVITIES

(CONTINUED)

B. STANDARDS FOR RECREATION AREAS

TYPE OF AREA	ACRES PER 1000 POPULATION	SIZE OF SITE IDEAL	SIZE OF SITE MINIMUM	RADIUS OF AREA SERVED
PLAYGROUNDS	1.5	4 ACRES	2 ACRES	0.5 MILES
NEIGHBORHOOD PARKS	2.0	10	5	0.5
PLAYFIELDS	1.5	15	10	1.5
COMMUNITY PARKS	3.5	100	40	2.0
DISTRICT PARKS	2.0	200	100	3.0
REGIONAL PARKS AND RESERVATIONS	15.0	500-1,000	VARIES	10.0

SOURCE: URBAN LAND INSTITUTE

TABLE E-4

GENERAL COMMUNITY PARKS AND RECREATION SPACE NEEDS

Crow Reservation Communities

POPULATION SIZE OF COMMUNITY	TYPICAL NUMBER OF CHILDREN		LOCAL MINIMUM SPACE NEEDS			
	Pre-School	Age 6-14 Years	Play Lots (acres)	Play Grounds (acres)	Play Fields (acres)	TOTAL
500	55	130	(3) 0.3ac.	---	---	0.3 ac.
750	83	195	(4) 0.4	3.0ac.	---	3.4
1000	110	260	(5) 0.5	3.0	15.0ac.	18.5
1250	138	325	(6) 0.6	3.0	15.0	18.6
1500	165	390	(7) 0.7	3.0	15.0	18.7
1750	193	455	(8) 0.8	3.0	17.5	21.3
2000	220	520	(9) 0.9	3.2	20.0	24.1
2250	247	580	(10) 1.0	3.5	22.5	24.2
2500	275	650	(11) 1.1	3.9	25.0	30.0
2750	302	715	(12) 1.2	4.3	27.5	33.0
3000	330	780	(13) 1.3	4.7	30.0	36.0

SOURCE: Harrison G. Fagg and Associates.

this kind of playground facility. The recommended size and spaces of a playground are not only more economical, but also prevent confusion between various groups utilizing recreation facilities.

A third type of community recreation facility to be considered is the playfield. This type of facility is intended for both young people and adults and provides a variety of recreational opportunities. A single playfield, if well developed, may serve more than one community or town. However, it is preferable for the facility to serve population witin a mile of its development. As a general standard, one acre per 800 population is desirable, with a minimum size of 15 acres. While basic standards vary, the space should be designed for the same facilities as playgrounds with additional space for football, baseball, archery, swimming pool, and, if desired, band-shell or recreation building. Once again, night lighting would be desirable. In the case of some smaller reservation towns, combining the community playground and playfield on the same site, yet separating their functions, may be logical.

Some generally accepted standards utilized for recreation activities and recreation areas are contained in TableE-3. These standards are not presented as goals for utilization on the reservation, but only as guidelines to providing an adequate amount of space to accommodate local needs in each reservation community.

Proceeding from the general parks and recreation standards for planning purposes, it is important to estimate the general community park and recreation space needed by the individual Crow Reservaton communities. To accomplish this, National Recreation standards were adapted to fit the needs and characteristics of Crow Reservation towns. The Population and Economic Study pointed out that the Crow Reservation has a larger number of children residents than the usual rural Montana situation. Consequently, the focus of local parks and recreation activity should be on facilities which meet the needs of children. Accordingly, the spacing foreseen in the individual reservation communities for this purpose is geared to the playlot, playground, and playfield type. TableE-4 contains estimates of local minimum space needs for communities of sizes ranging from 500 to 3,000 in population as might be anticipated on the Crow Reservation during the next 25 years. From this table one can determine the general range of park facilities appropriate to the size of town in question. Also,

TABLE E-5

ADVANTAGES AND DISADVANTAGES OF VARIOUS SURFACINGS FOR RECREATION AREAS

Surfacing Type	Advantages	Disadvantages
Turf	Soft surface, ideal for many play purposes. Low first cost.	Cannot be used in wet weather. Difficult to maintain.
Natural soil	Low first cost. Soft surface	Muddy in wet weather, dusty in dry weather.
Gravel	Low first cost. Pleasing appearance	Child throw it about to such extent that it is unsuitable for any use as surfacing in housing developments.
Sand-clay and clay-gravel	Low cost when suitable material available. Reasonably soft surface.	Difficult to get properly proportioned mixture.
Brick (on sand cushion)	Attractive appearance	Initial cost relatively high.
Stone paving blocks (on sand cushion or natural soil).	Low cost when salvaged from old pavements. Satisfactory appearance. Durability.	Surface too rough for play use.
Precast concrete slabs (on sand or natural soil).	Year-round utility. Satisfactory appearance.	Maintenance cost relatively high.
Flagstones (on sand or natural soil).	Year-round utility. Pleasing appearance. Durability.	
Bituminous concrete.	Good surface for most play purposes when properly specified and laid. Not so hard on feet as portland cement concrete. Year round utility.	Rough and abrasive unless properly specified and constructed. (Competent inspection essential for good workmanship.) Hot for bare feet. May become soft. Unattractive in large areas.
Cork asphalt.	Resiliency. Excellent surfaces for many play purposes. Year-round utility. Satisfactory appearance.	Comparatively high cost. (Competent inspection essential to good workmanship). Softens in very hot weather.
Portland cement concrete	Year-round utility. Minimum maintenance expense. Good surface for wheel toys, roller skating and some court games.	Lacks resiliency. Initail cost relatively high. Large areas require expansion joints. Whiteness and glare of large areas unattractive.

TABLE E-6

RECOMMENDED SURFACINGS FOR RECREATION AREAS, RELATED TO DENSITY

Kind of Area	Low and Moderate Density Areas (Singles, twins, row houses, and flats)	High Density Areas (apartments)
General recreation area	Turf, natural soil	Bituminous concrete and sandclay, natural soil.
Special play areas:		
Child service play yards	80% turf, 20% concrete	80% turf, 20% concrete.
Game courts	Bituminous concrete, portland cement concrete, sand-clay, turf.	Bituminous concrete, portland cement concrete, sand-clay, cork asphalt.
Under playground apparatus	Lightloam, sand, tanbark, sawdust, shavings, turf.	Light loam, sand, tanbark, sawdust, shavings.
Crafts and story-telling	Any hard surfacing or turf	Any hard surface or turf.
Outdoor parties, dances, roller skating, etc.	Any smooth, hard surfacing	Any smooth, hard surfacing.
Local play areas:		
For small children	Principally turf or natural earth, and smooth hard paving.	Principally a smooth hard paving and some turf or natural earth.
For all age groups	Turf, bituminous concrete, portland cement concrete.	Bituminous concrete, cork asphalt, portland cement
Sitting areas	Bituminous concrete, portland cement concrete, brick, precast concrete slabs, flagstones.	Concrete

THESE GENERAL INDICATIONS OF PARKS AND RECREATION SPACE NEEDS WILL BE USEFUL TO LOCAL DECISION-MAKERS REGARDING THE ALLOCATION OF LAND FOR SUCH USE AS THE INDIVIDUAL RESERVATION COMMUNITIES GROW. DESIGNATION OF THESE APPROPRIATE AMOUNTS OF LAND FOR PARKS AND RECREATION USE, COUPLED WITH THEIR DEVELOPMENT BY UTILIZATION OF THE THREE FACILITIES INDICATED IN THE DISCUSSION, SHOULD PROVIDE THE LEVEL OF PARK AND RECREATION LAND NECESSARY TO ACCOMMODATE BOTH THE NEEDS OF TOWN RESIDENTS AND THOSE RURAL INHABITANTS LIVING NEAR-BY. THESE STANDARDS AND CONCEPTS ARE EMPLOYED IN THE FUTURE LAND USE TABLE PRESENTED IN THE LAND USE ELEMENT OF THIS COMPREHENSIVE PLAN.

CHURCHES

THE JESUIT PRIEST, FATHER PIERRE-JEAN DESMET, IS THE FIRST RECORDED RELIGIOUS MAN TO FIND HIS WAY TO CROW COUNTRY. RETURNING FROM THE FLATHEAD COUNTRY IN THE FALL OF 1840, DESMET ENCOUNTERED THE CROW NEAR PRESENT DAY BILLINGS. HE TRAVELED EAST WITH THEM FOR SOME DISTANCE UNTIL THEY REACHED A LARGE CROW VILLAGE ON THE BIG HORN RIVER NEAR ST. XAVIER. DESMET REMAINED WITH THE CROW FOR ABOUT TEN DAYS AND TOOK ADVANTAGE OF THE OPPORTUNITY TO PASS AMONG THEM AND EXPLAIN THE VARIOUS POINTS OF RELIGION.

TWO DIFFERENT RELIGIOUS DENOMINATIONS ESTABLISHED SCHOOLS ON THE CROW RESERVATION IN 1887. THE MONTANA INDUSTRIAL SCHOOL WAS LOCATED ON THE BIG HORN RIVER ON THE NOW CEDED PORTION ABOUT SEVEN MILES FROM CUSTER, MONTANA. THE REVEREND H. F. BOND OF THE SPONSORING UNITARIAN ASSOCIATION OF BOSTON SUPERVISED THE CONSTRUCTION AND THE OPERATIONAL STAFF OF TEACHERS AND ASSISTANTS FOR THE "NICE COMFORTABLE SCHOOL BUILDINGS." THE CHURCH SCHOOL CLOSED ITS DOORS TEN YEARS LATER WHEN THE STUDENTS WERE TRANSFERRED TO THE MANDATORY ATTENDANCE CROW BOARDING SCHOOL.

ST. XAVIER MISSION SCHOOL AND CHAPEL WERE ALSO CONSTRUCTED IN 1887 NEAR THE MOUTH OF ROTTEN GRASS CREEK ON THE BIG HORN RIVER. THE MISSION WAS THE RESULT OF TWO YEARS PREVIOUS WORK BY FATHER PAUL PRANDO AND FATHER URBAN GRASSI AND WAS STAFFED BY URSULINE SISTERS. THE CATHOLIC MISSION EXPANDED THE FACILITIES IN 1892.

SHORTLY AFTER COMPLETING THE ST. XAVIER MISSION IN 1887, THE JESUITS moved on to the Pryor area where they constructed a similar edifice--The St. Charles Mission. Both St. Xavier and St. Charles still stand and operate today.

The final church school to establish itself on the reservation was the Mission Day School of the Baptists at Lodge Grass. Opened in 1905 by Dr. W. A. Petzoldt, their new approach with the school children living at home was very well received by the Crow.

The churches, at least the early one, believed the way to convert the Crow to their religion was through schools. The idea met with some success as today most Crow belong to one of the several churches on or near the reservation:

HARDIN

Ascension Episcopal Church
Bible Christian Tabernacle
Christ United Church of Christ
Christian Science Society
Church of Jesus Christ of Latter-Day Saints
Church of the Open Bidle
Federated Church
First American Luthern Church
First Baptist Church
First Church of God
First United Methodist Church
Foursquare Gospel Church
Immaculate Conception Church
Redeemer Luthern Church
St. Joseph Catholic Church
St. Thomas Episcopal Church Mission
Seventh Day Adventist Church
Southern Baptist Church
United Pentecostal Church
Weseleyan Methodist Church
First Congregational Church

CROW AGENCY

Burgess Memorial Baptist Church
First Church of God
Crow Indian Foursquare Church
St. Dennis Catholic Church
St. John Lutheran Church

LODGE GRASS

Assembly of God Church
First Crow Indian Baptist Church
Our Lady of Loretto Catholic Church
Chivers Memorial Baptist Church
Little Brown Church (Baptist)
Pentacostal Church of God

PRYOR

St. Charles Mission (Jesuit Cathodlic)

ST. XAVIER

St. Xavier Mission (Jesuit Catholic)

FORT SMITH

St. John Lutheran Church

WYOLA

Community Baptist Church
Tekawitha Catholic Church

The old time Crow Indians depended upon the medicine men, as the visionaries and healers, for their religious guidance. There was no single form of worship as the medicine men often founded various religious organizations which were joined by those looking for spiritual assistance. These organizations worshipped individually or in small groups during rituals such as the Sun Dance, the Wound Healing Ceremony, the Sacred Pipe Dance, or one of the many others. Although a few of the rituals have survived to the present day as a matter of habit and form, the native beliefs and ceremonial systems have become obsolete.

A number of the tribal membership belong to the Native American Church which is a hybrid religious group with a combination of native beliefs and Christian ethics forming the basic doctrines and observances. This church utilizes Peyote, a type of cactus herb, as a sacrament much in the same manner that the Christian churches uses bread or wine.

CEMETERIES

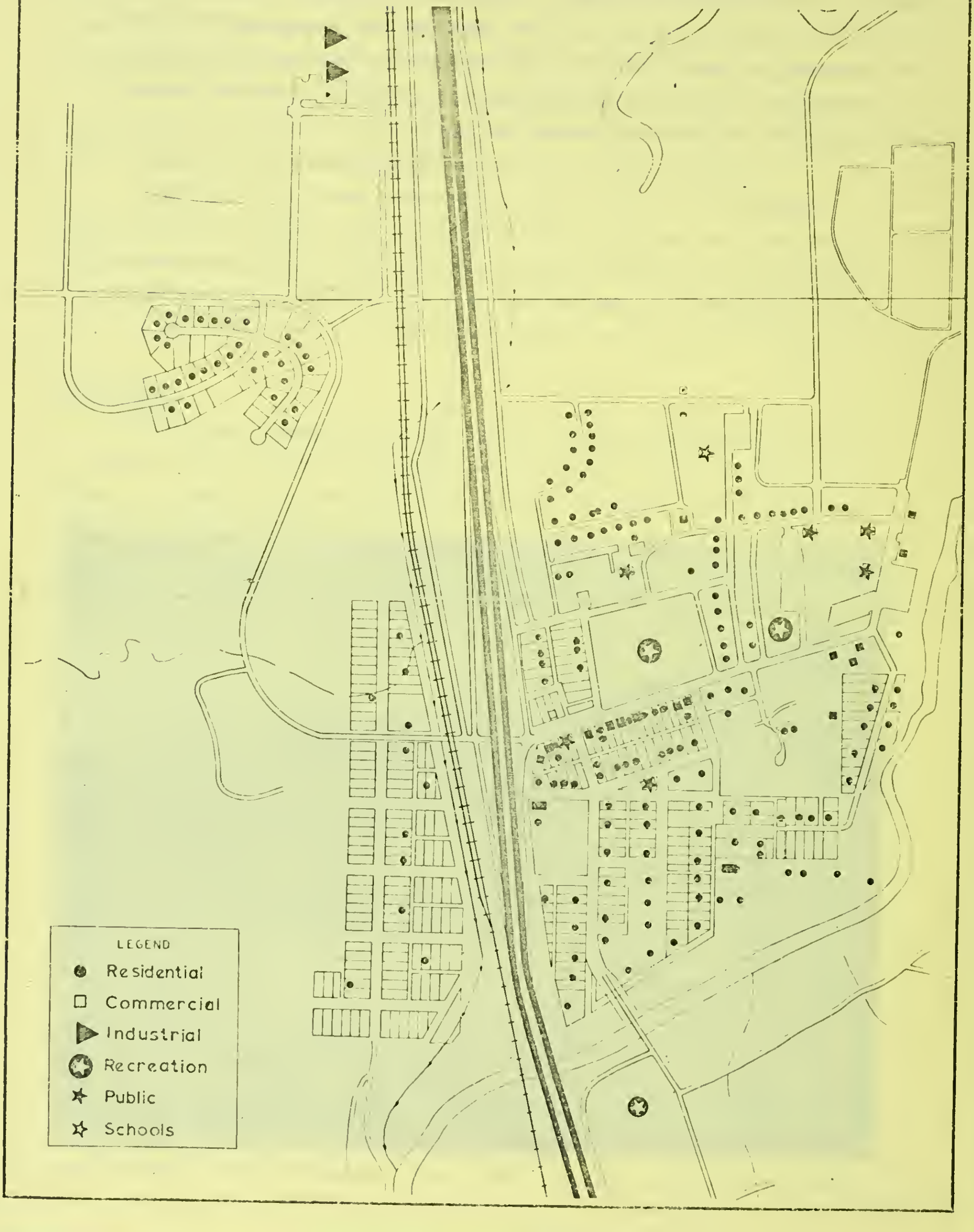
Each of the communities on the Crow Indian Reservation, with the exception of Fort Smith, have cemetery facilities. At St. Xavier and Pryor, the cemeteries are associated with the Missions. The church also owns one of the two cemeteries at Lodge Grass. All of the community and church affiliated grounds appear to be adequate for projected future needs. Additional grounds maintenance and landscaping would be desirable according to each individual contacted, however, this does not affect the availability of sufficient gravesites.

Of the seven cemeteries visited, only the director of the Custer Battlefield National Cemetary near Crow Agency expressed concern about a lack of space. According to his figures, the National Cemetary will have no available burial space within the next three to five years unless additional grounds are purchased or otherwise obtained for burial sites. The Custer Battlefield facility is administrated under the same regulations as other National Cemetaries such as Arlington, Vicksburg, Black Hills, and others. Any veteran may be buried there on application of the survivors. Due to the nearly constant state of war since the late 1930's, the grounds of the Custer cemetary have been used up in about 15 percent. of the time originally projected.

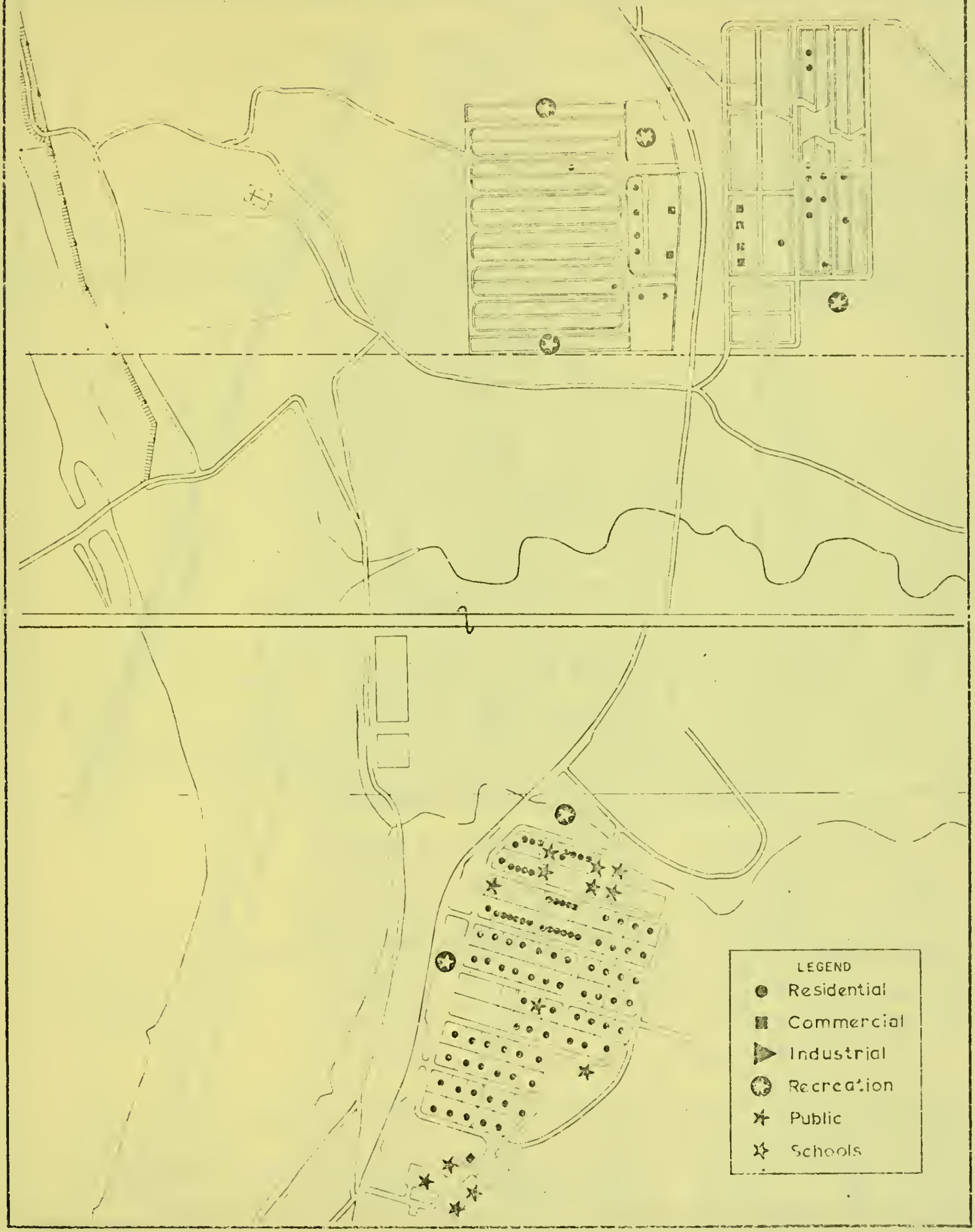
No licensed mortuaries or funeral homes exist on the Crow Reservation. The closest are located in Billings for the western portion, Hardin for the eastern portion, and Sheridan, Wyoming, for the southeastern corner. Due to several complaints noted as to excessive charges

MADE BY THE OFF-RESERVATION FIRMS, IT APPEARS IT WOULD BE ADVISABLE FOR THE TRIBE TO ENCOURAGE A MORTICIAN TO LOCATE ON THE RESERVATION AND POSSIBLY SERVICE BOTH THE CROW RESERVATION AND THE NORTHERN CHEYENNE RESERVATION. THE INDIAN HEALTH SERVICE HAS INDICATED A WILLINGNESS TO PROVIDE ASSISTANCE IN MAKING THE NECESSARY ARRANGEMENTS.

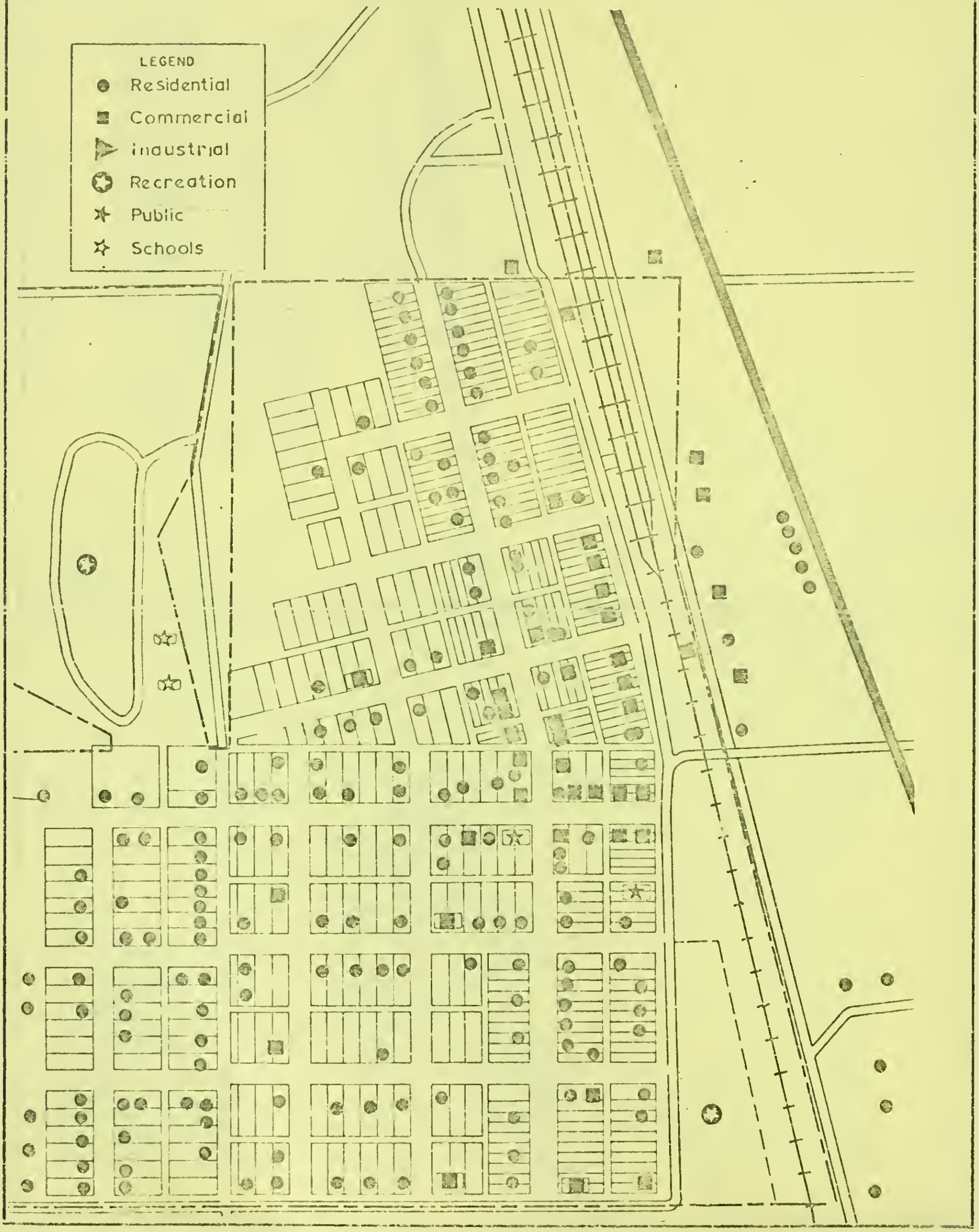
CROW AGENCY COMMUNITY FACILITIES



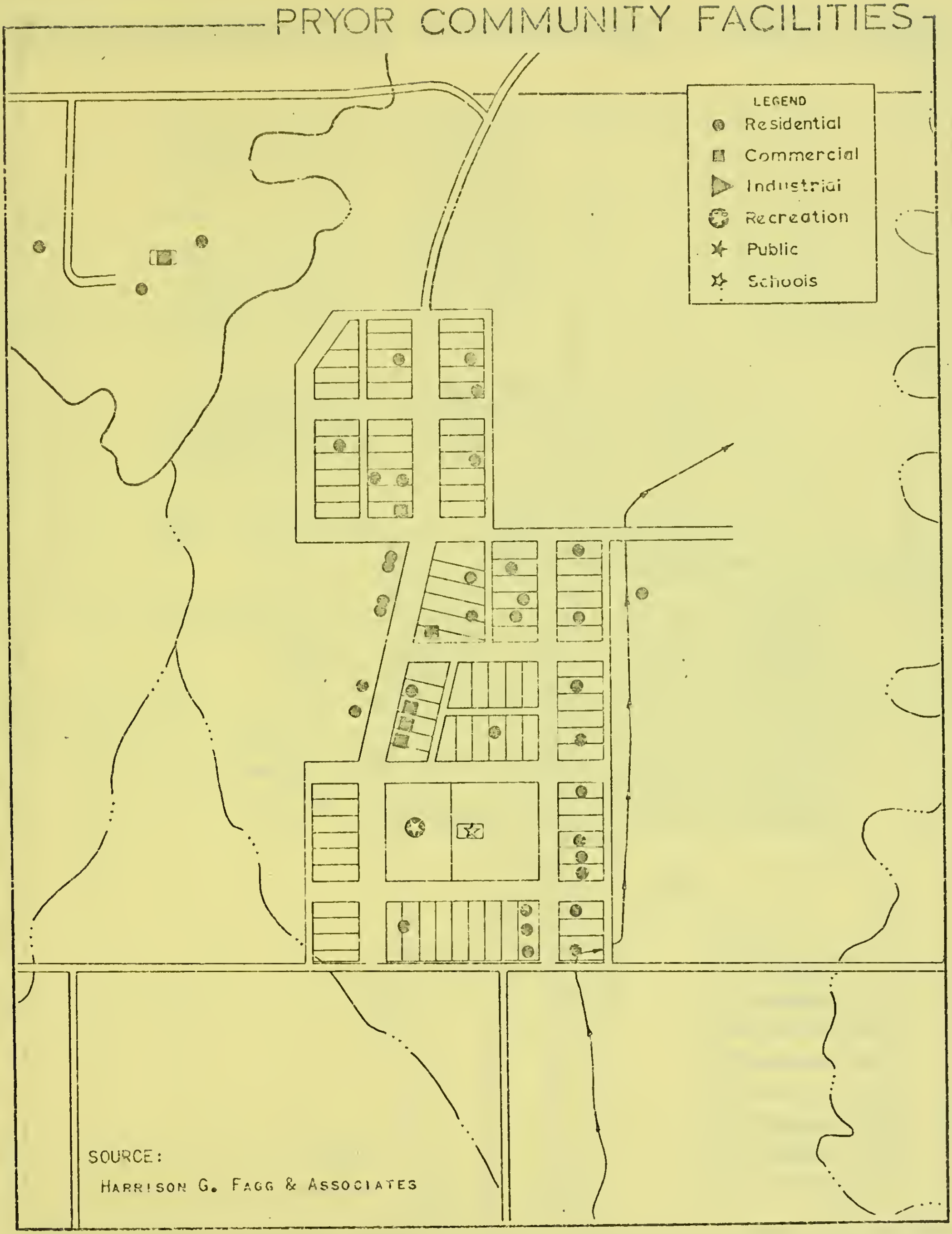
FORT SMITH COMMUNITY FACILITIES



LODGE GRASS COMMUNITY FACILITIES

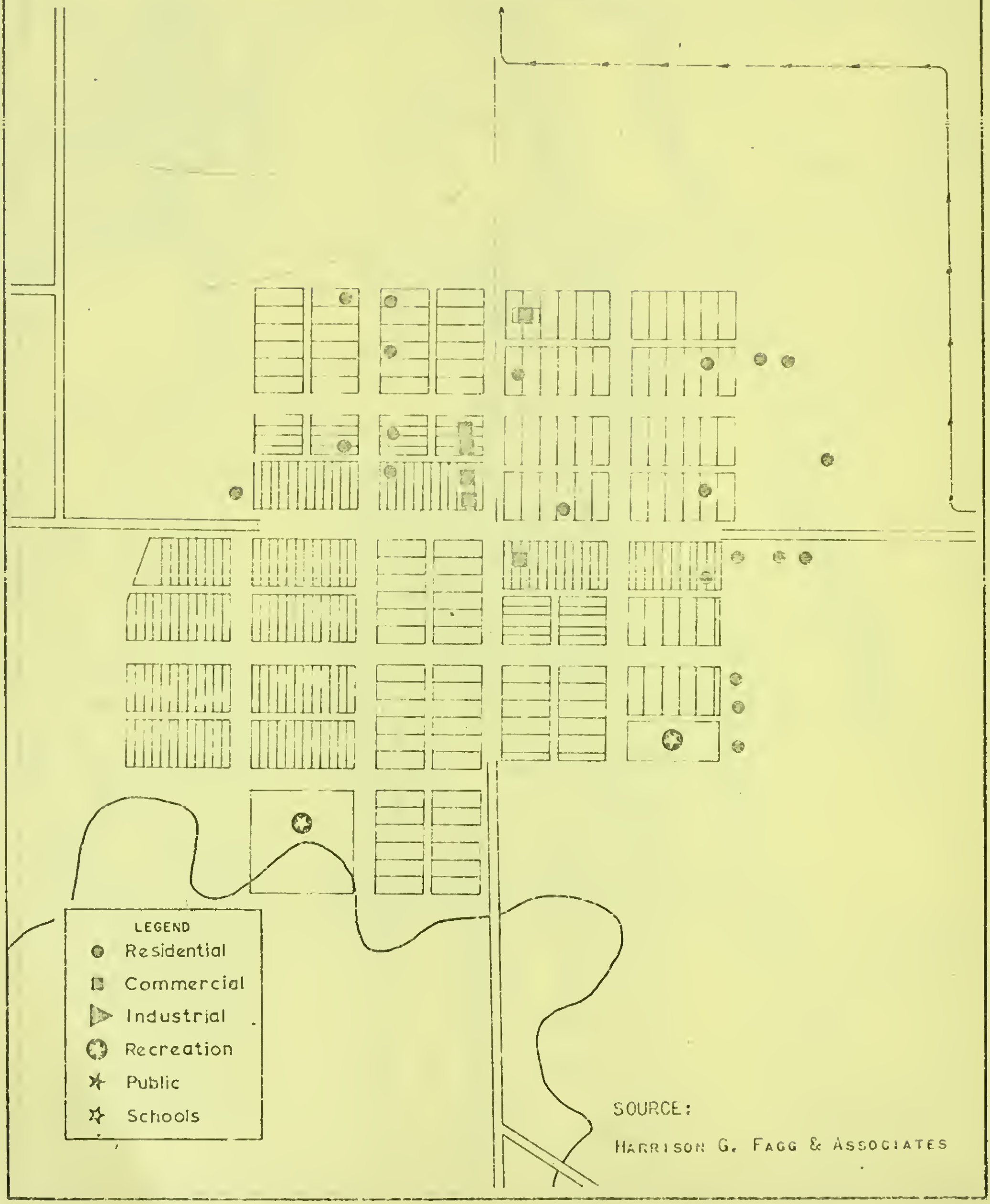


PRYOR COMMUNITY FACILITIES



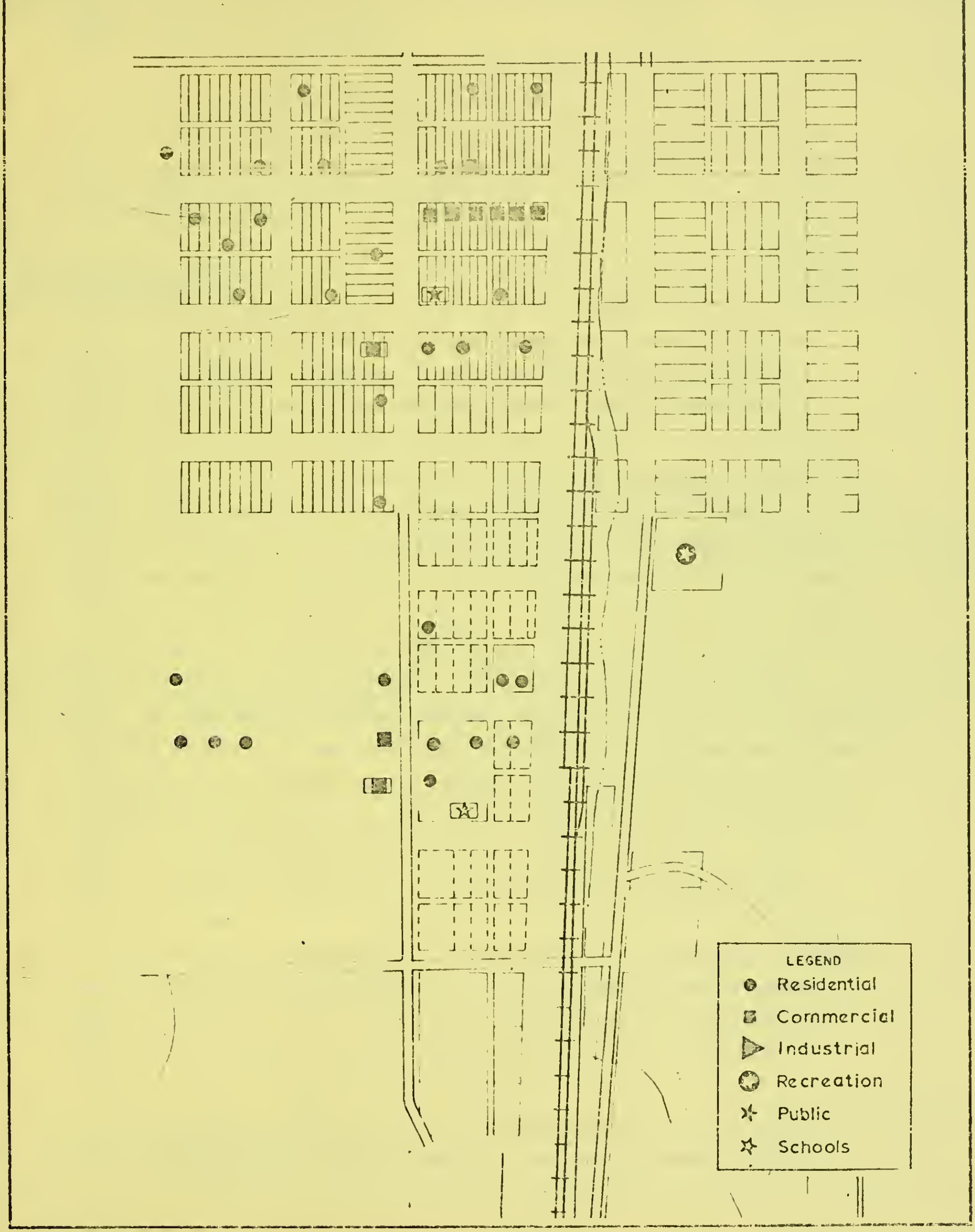
SOURCE:
HARRISON G. FAGG & ASSOCIATES

ST XAVIER COMMUNITY FACILITIES



SOURCE:
HARRISON G. FAGG & ASSOCIATES

WYOLA COMMUNITY FACILITIES



PUBLIC UTILITIES AND SERVICES

The Crow Indian Reservation is fortunate in having relatively good public utilities and services throughout most of the reservation area. More extensive analysis of utilities and services will be found in the economic portion of this study.

Electrical Service

Electricity is furnished to most of the reservation by Big Horn County Electric Cooperative with offices in Lodge Grass although a few small locations are served by the Yellowstone Valley Electric Cooperative. As evidenced by the consultants survey, electrical service to residences is nearly 100 percent. This figure is substantiated by the utility companies and they are of the opinion that the remote homes without electrical service are, for the most part, utilizing home/farm light plants for power when it is needed. Nearly all of the homes without electrical service are owned by older Indian residents.

The cooperatives established policies provide that service will be made available to consumers of the cooperative for all farm and home, town residential, school, church, community buildings, irrigation projects, commercial, and industrial uses subject to established rules and regulations. A basic rate of $2 per month for in-town service and $3.25 for rural service is paid for residential use. Additional charges are made according to the total kilowatt hours used. The monthly bills are increased 10 percent for non-payment within ten days of billing.

Electricity is purchased by the cooperatives from several different sources dependent upon the demand. The Bureau of Reclamation power plant at Yellowtail Dam is the major source of energy. Additional power may be purchased from the Montana Power Company and Pacific Power and Light if demand is great enough.

The potential construction of a thermo-electric on the reservation in connection with development of the coal reserves on and adjacent to the reservation would provide a substantial increase in available power. This power source, if developed, could be enough of an incentive to encourage large power users (industry) to locate on the reservation in order to take advantage of the lower rates near a primary power source. However, this development, if it does take place, is still quite aways in the future--perhaps as much as ten to twenty years.

Natural Gas and Fuels

Crow Agency is the only reservation community that benefits from natural gas service although the main line from the Wyoming fields to Eastern Montana cross the reservation on a diagonal line from Pryor Gap to Hardin, then north to the Yellowstone River. The only utility furnishing gas service in the area is Montana-Dakota Utilities. The rates for service have increased since compiling the information for the economic portion of this study, and they have not been made available to the consultant up to the present date.

The only service line for natural gas traces a route from Hardin to Crow Agency. This line reaches as far south as the Sun Motel complex and also services the Crow Industrial Park. The rural area along the Interstate 90 route from Hardin to Crow Agency also receives limited gas service. Within Crow Agency, natural gas is available to residential, commercial, and governmental buildings.

Natural gas is not available, at the present time, to the remainder of the reservation communities and rural areas due to the large distances to be covered and the limited population once it was extended. In other words, in order to justify extension of service lines to Lodge Grass or even Pryor, it would take a new major user such as the Mohasco Carpet Mill and Motel Complex.

Private companies now service the other communities and rural area with liquid propane bottled gas.

Telephone

Telephone service is available to all reservation communities through Mountain State Telephone and Telegraph Company. Pryor was the last community to receive service through the efforts of the Crow Tribal

Council and local area residents. They now have direct line service through the 259-Billings exchange. Due to the concentrated drive for telephone subscribers needed to bring in service, the rural area between Billings and Pryor has the highest concentration of telephones of any rural area on the reservation. Without an adequate number of subscribers, the cost of furnishing service to rural and remote areas is prohibitive from the customers point of view.

Exchanges centering on Hardin, Crow Agency, Fort Smith, Lodge Grass, Wyola, and Billings (Pryor) serve the reservation. A total of 741 telephones, including 650 home service telephones provide 44.6 percent of the reservation households with service. Less than 10 percent of the Indian homes have service according to the consultants survey.

TELEPHONE SERVICE BY EXCHANGE PREFIX

PREFIX	LOCATION	COMMERCIAL	RESIDENTIAL	TOTAL
259-	Pryor and Vicinity	2	98	100
343-	Wyola and Vicinity	8	52	60
638-	Crow Agency and Vicinity	23	93	116
639-	Lodge Grass and Vicinity	34	207	241
665-	So. and East of Hardin	5	95	100
666-	Fort Smith and Vicinity	19	105	124
	Reservation Total Service	91	650	741

Although there is no established criteria for the provision of electrical power, natural gas service, or telephone service, it is assumed that these public service utilities will continue to meet the demands of the public as they have in the past. The only restriction on service is the financial feasibility to the utility and the consumer.

Uniform standards for the placement of these and other utilities within the public right-of-ways in the communities are needed. Such standards should permit more economical design and construction and allow for a mimimum of disturbance as new construction takes place.

SOLID REFUSE DISPOSAL

Controlled solid refuse disposal on the Crow Indian Reservation is practically non-existent and refuse is allowed to accumulate in large amounts. Several clean-up campaigns have been initiated through the joint efforts of the Crow Tribe, the U. S. Public Health Service, the Bureau of Indian Affairs, and civic organizations.

At Crow Agency, a semi-regulated landfill operation exists to the northwest of town. The BIA periodically makes available its equipment to cover the newer disposals. They have also used their equipment to raze dilapidated buildings. remove trash and junk, and dispose of old, unsightly abandoned cars. At other communities the dumps are fired, either intentionally or otherwise, and offensive odors and smoke are produced. Little attempt is made to separate garbage from rubbish. The situation at most rural homes and farms is equally poor. The town of Lodge Grass operates a garbage collection service.

The Public Health Service has initiated a program aimed at promoting better garbage and refuse collection and disposal procedures throughout the reservation in order to prevent propagation of diseases borne by insects and rodents, and to correct community unsightliness. Information about proper disposal has been disseminated to local residents through group meetings and individual contact.

Despite the efforts of the various governmental agencies solid refuse disposal is an ever increasing problem. Open dumps on either a community or individual basis are not acceptable because of the nuisance conditions and health hazards. Incineration under controlled conditions would not prove satisfactory due to the low population and the relatively expensive initial cost and operation and the air polution factor. Since the incineration of garbage must be used in combination with a landfill operation, landfill will be the most practical and effective method of dealing with this problem.

With the availability of required equipment, the landfill method of disposal may be initiated with relatively no cost. Site acquisition, if it is required, would be the major expense. A site located between Wyola and Lodge Grass should be able to adequately service the two communities. St. Xavier and Fort Smith should be able to share a landfill. Pryor, due to its remoteness, and Crow Agency will require their own operations. If the sites are coordinated with future recreation plans the operation may be of mutual benefit through improvement of low lands by filling.

At a future date it is recommended that the Tribe initiate a collection service to pick up both rubbish and garbage. A single truck, operating five days a week, would be able to service each of the reservation communities at least once a week. Residents in outlying areas could bring their garbage and rubbish in to a temporary site for truck collection or simply take it to the nearest landfill. To minimize insects and rodents spreading disease an ordinance should be enacted requiring residents to either wrap their garbage or place it in the newly marketed plastic garbage bags.

STORM SEWER SYSTEMS

Underground storm sewer systems to carry surface runoff and street wash do not exist in any of the Crow Reservation communities. Although some isolated locations do have standing water following a rainshower or rapid snowmelt, a general storm sewer system is not required at the present time or during the planning period. During the few occasions when standing water does occur, natural drainage and evaporation eliminate the offending pools within a matter of hours. The majority of these locations are on private property where the natural drainage has been altered through construction of parking lots, building sites, access roads, and similar projects.

Other than natural drainage, ditches, culverts, and curbways where necessary are a part of regular road construction projects. As a general rule, the man made system eventually flows into a natural one and the storm runoff is dispersed. Periodic flooding will take place in the drainage basins at intermittent intervals. However, future consideration of topography and good flood plain management will keep the effects of flooding confined to non-residential areas.

Unless the population increases several times over what is projected for during the planning period and the increase occurs in an existing or new townsite, an underground storm drainage network will not be justified. Isolated cases may occur where a subdivision is partially or wholly located in a topographic depression, but in these cases it will be the responsibility of the land developer to provide adequate landscaping--including drainage. As a guideline for future development, the following general requirements should be established.

1. Reasonable basis for assumed runoff quantity from design (five year) storm.
2. Provision for handling waters from upper areas as well as development level.
3. Preservation of natural drainage where possible with adequate channel right-of-way through 25 year flood plains where applicable.
4. Prohibit storm drainage into active irrigation ditches to prevent flooding.
5. Require residential or commercial land developers to provide drainage in depression areas.

SANITARY SEWER SYSTEMS

Residents of the Crow Indian Reservation are served by a wide variety of sewage disposal systems. The type of system is primarily determined by their place of residence--whether they live in the rural areas or in the more built up communities. Rural homes throughout the reservation have individual septic tanks or cesspools and drain fields while the larger communities have collection lines and treatment facilities. Residents of the primarily rural communities of Pryor, St. Xavier, and Wyola are served by their own septic tanks and drainfields with many of the facilities having been provided to the Indian residents by the Public Health Service under Public Law 86-121. The split community of Fort Smith is served by two separate systems. The government community wastes are removed through the system constructed and operated by the Bureau of Reclamation while the "private" town outside the take line is serviced by a community system operated and maintained by the residents. The Bureau of Indian Affairs and the Public Health Service constructed a community system at Crow Agency that drains to a ten acre lagoon for treatment. Lodge Grass city sewage is similarly collected by mains and transported to a lagoon.

The systems utilized by the individual farms and rural residences will not be discussed at length in this report since they are, for the most part, providing adequate treatment and will continue to do so throughout the planning period. They will only require normal maintenance procedures on a regualr basis to continue efficient operation.

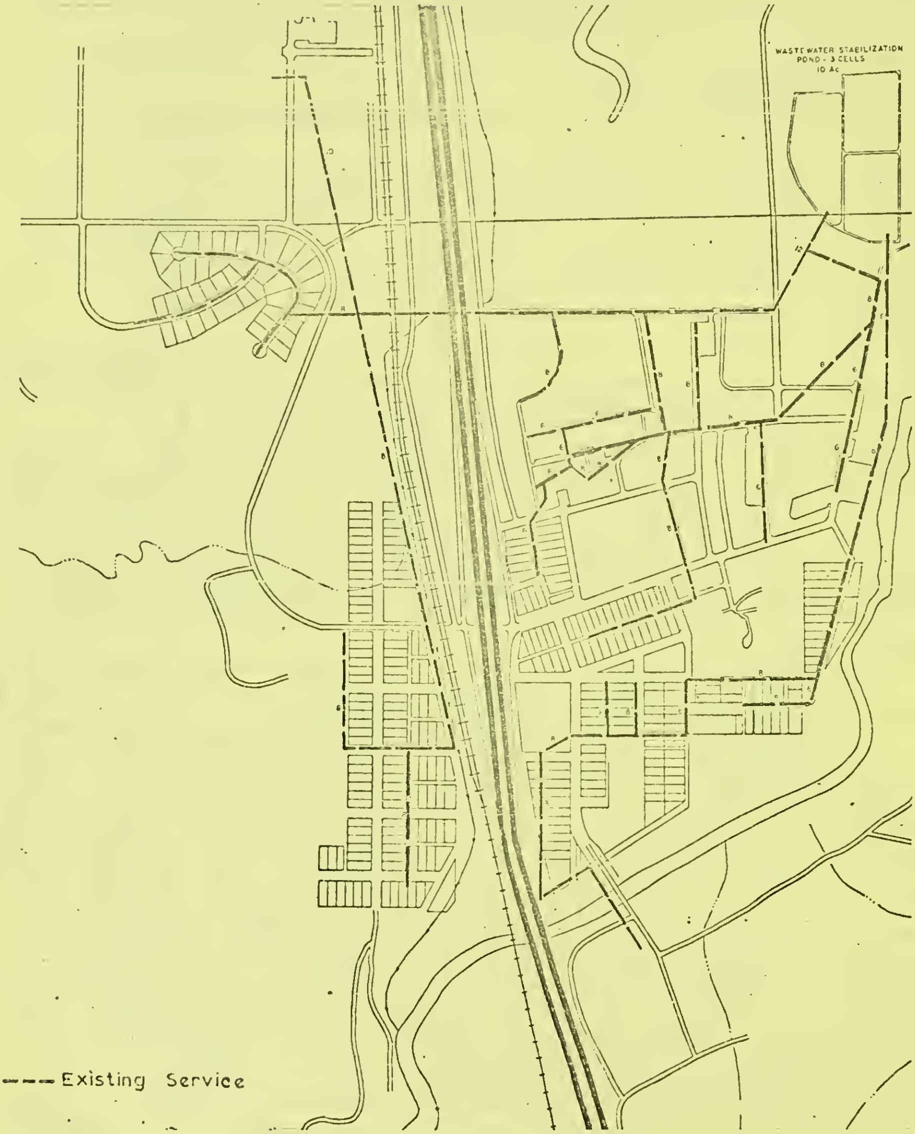
Before leaving the rural area of the reservation, however, it is well to note that agricultural uses are great potential water polluters. The answer to this is to keep the residues and effluents out of water courses through the development and application of sound land management problems.

Agricultural chemicals--insecticides, herbicides, fungicides, rodenticides, etc.-- while bringing about a tremendous increase in productivity and the quality of agricultural products, also pose a threat to the environment. Domestic farm animals also pose a problem. For example, one cow generates as much waste as 16.4 human beings, one hog is equivalent to two people, and seven chickens are equal to one person. In total, farm animals in the United States produce ten times as much waste as the human population and in this country the human population and the domestic animal population increase along similar curves. In many respects, the problem of community waste is an easier one to solve than that of the farm. The nutrient sources are under greater control, and wastewater can be channeled to treatment facilities where most of the undesirable impurities can be removed before the water is discharged. Animal and farm wastes are not easily taken care of.

According to the consultants survey, 33.1 percent of the reservation population is served by a public sewer system.

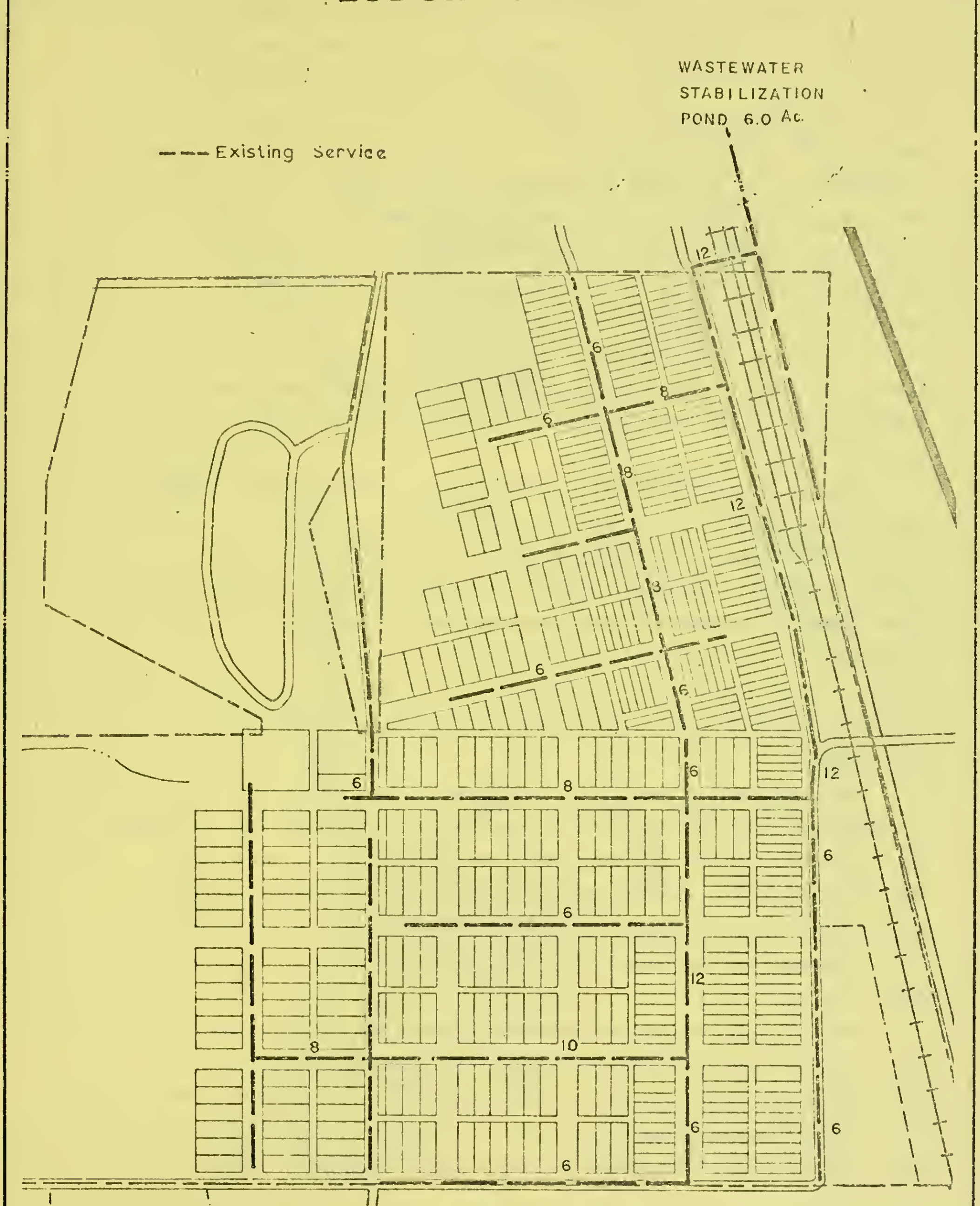
In Crow Agency a collection system of sewer mains carries the community effluent to a lagoon to the northeast of town. At the lagoon two lift stations pick up the waste and discharge it into the lagoon cells for treatment. The network of 6", 8", 10", and 12" sewer mains within the community and the ten acre waste stabilization lagoon are adequate to take care of the domestic needs. However, the large volume of industrial waste resulting from the carpet factory operation threatens to overload the system's capacity. If additional commercial-industrial growth occurs that will further add to the disposal problem, it will be necessary to expand the treatment facility within the five to ten year period. At this time, expansion appears to be a certainty.

CROW AGENCY



EXISTING SANITARY SEWER UTILITIES

LODGE GRASS



EXISTING SANITARY SEWER UTILITIES

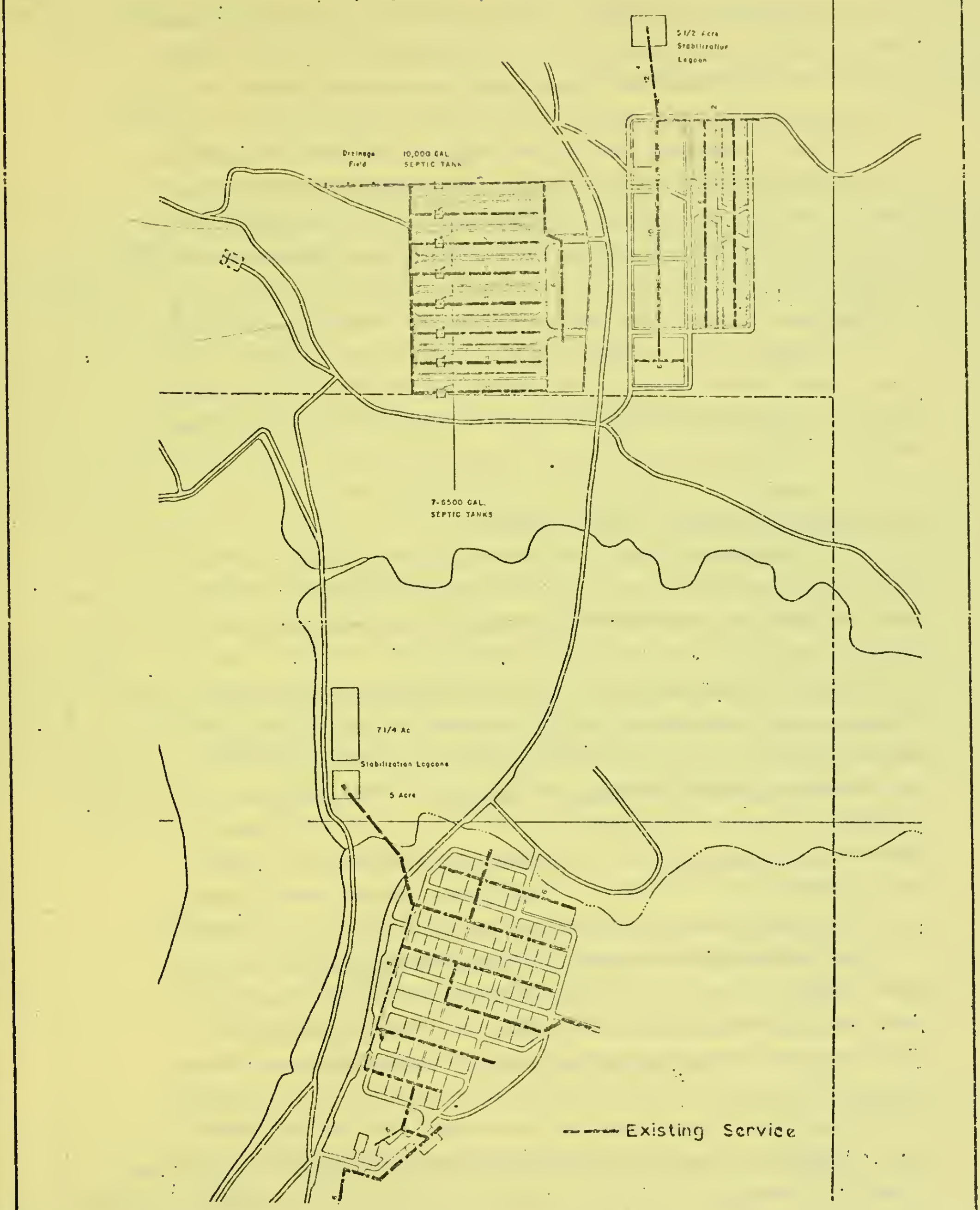
The Lodge Grass sanitary sewer system is slightly undersized and will have to be expanded to meet the needs of any appreciable population growth. The treatment lagoon to the north of the community is tied to the collection point by a 12" outfall line. A collector system of 6" to 12" lines deliver the wastes to the collection point. A recent examination of the collection lines has shown them to be in good condition and adequate to handle present and projected needs within their service area. If significant growth occurs outside of the present service area it will be necessary to either install a new collector line to handle the waste increase, or enlarge the closest line for the additional flow. The six acre waste stabilization lagoon will require expansion to handle any appreciable wastewater increase. It is anticipated this situation will occur within the next ten years.

Fort Smith is more truly an occurrance of several subdivisions within relatively close proximity of each other than a community. Up to the time that construction was begun on Yellowtail Dam, very little occurred in the area as far as a built-up area was concerned. With Yellowtail underway, first a government town was started within the boundary. Then two separate trailer courts were established on either side of the highway just outside the government line. As a result, three separate sewage systems exist within about ¼ mile of each other.

The system maintained by the Bureau of Reclamation is made up of a network of 6" mains that feed into an 8" collector line that discharges into the lift station. An 8" outfall line from the lift station to the 12¼ acre, 2 cell lagoon completes the system. The entire system was designed to accommodate the demands of 500 persons which substantially exceeds the approximately 80 that now reside in the "government" camp.

About ¼ mile east of the government camp, two subdivisions originally designed for trailers are situated on opposite sides of the highway. The subdivision to the north of the highway has a network of 4" collector lines that empty into seven separate 6500 gallon septic tanks.(one for each block) and a single 10,000 gallon tank that

FORT SMITH



EXISTING SANITARY SEWER UTILITIES

services the commercial portion. The tanks drain into an 8" collector line that carries the runoff to the drainage field. Original design capacity was for 250 persons within the trailer blocks and an equivalent of 165 persons for the commercial area. Across the highway, the second trailer park is serviced by a system of 6" and 10" mains that empty to a 12" collector system. The collection lines go to the outfall lines to here the effluent is pumped to a five acre lagoon for stabilization. This system was designed to accommodate wastes from about 500 persons.

Between the three existing collection and treatment facilities at Fort Smith a total of 1915 persons, or equivalent, may be served. This is more than adequate to accommodate growth during the next ten years. No additions or modifications are necessary to the existing system.

Future Growth and Sewer System Expansion

As is discussed later in the "Population and Economies" portion of the preliminary plan, the projected population growth over the next ten years will be about 420 persons. This figure does not reflect any appreciable development in the Fort Smith area, nor does it consider the possible increase that will come with the mining industry if development of the coal reserves does occur during this period. Based upon the past twenty years, it is not anticipated that Pryor, St. Xavier, or Wyola will expand. This means that the growth will occur in the rural area and in the Lodge Grass and Crow Agency communities. Previous growth has been almost evenly split between the rural area and the communities and there is no reason to assume that this trend will change during the next decade.

The majority of the community growth should take place in the Crow Agency area where recent developments such as the industrial park, the Sun Motel Complex, the growth of tribal administrative functions, and complete utility service will serve to draw more people to the area. Given a straight line projection, the growth in the Crow Agency area should be approximately 100 to 125 persons. Lodge Grass will probably not develop its business community rapidly enough to encourage any number of people to settle there. However, natural increase should amount to about 50 to 75 persons. The Fort Smith area should gain the remainder of the population growth in the communities due to the completion of some recreational projects connected with the Big Horn National Recreation Area during the period.

As previously stated, the residential developments at Fort Smith are more than adequate to accommodate nearly ten times the number of people presently resident there. Therefore, no sewage disposal improvements are proposed for the area. Within Crow Agency and Lodge Grass the sewer mains, collection lines, lift stations, and outfall lines have sufficient capacity remaining to handle substantial increases in population. However, in both locations the stabilization lagoons are approaching capacity.

The Lodge Grass stabilization unit is already below standard according to the guidelines established by the U. S. Environmental Protection Agency and the Montana State Board of Health. A minimum of an additional two acres of stabilization lagoon is needed to bring the facility up to standard. Therefore, to meet the existing need and that of population growth over the decade, it is recommended that an additional five acre cell be constructed adjacent to the existing pond.

The Crow Agency problem is somewhat different since their lagoon is capable of handling several hundred additional persons--or equivalents. Industrial and commercial growth in the vicinity have placed the treatment pond in a near capacity use category. There are two alternatives to this situation:

1. Construct an additional cell adjacent to the existing lagoon to handle the increased load, or
2. Construct a separate treatment facility near the industrial park that is designed to handle wastes such as those discharged by the Mohasco plant. This would substantially decrease the load on the present facility and allow the community to grow over 1½ times its current size without overtaxing the present lagoon.

From a practical standpoint, it would be initially less expensive to expand the current facilities to handle the increased load. However, If the carpet factory expands within the decade as is currently planned, the latter method will provide the best solution. The mill is now operating at a minimum production level and it seems probable that they will have to either expand or go out of business within the ten year period due to inflation. Also, if an adequate treatment facility for industrial waste is constructed near the industrial park it will provide an additional incentive to encourage other industries to the area.

The discharge from the Mohasco plant is approximately equal to 400 persons. Assuming that expansion does take place within the decade to the level planned, wastes will be an 800 to 1000 person equivalent following the increase. Using the EPA guidelines, an 8 to 10 acre lagoon would be necessary to handle the sewage. This is the same size as the facility now serving the entire Crow Agency community. Other small industries will undoubtedly be encouraged to establish in the area during the planning period. Therefore, it is recommended that a mimimum of a 12 acre stabilization pond be constructed for the industrial park and that a study be made into the advisability of providing an industrial waste pre-treatment facility as well to enable the sewage to be neutralized prior to treatment.

A sewage system which allows flexibility to meet changing conditions is desirable. This can be accomplished by designing sewer sizes to handle both present and future needs, and by a treatment plant which will allow expansion at minimum expense. Where economics do not justify large sewer main construction in all areas, temporary pumping stations have been used until population densities warrant permanent trunk line installations.

As public facilities are available within the reservation communities, connection to such a system should be required, since this will allow for better sewer system planning. A determination is needed for availability, and a definite distance should be set.

The individual communities should have a definite policy for determining the method by which service extensions are made. Whatever method is used, it should allow extensions to be made where economic and health factors make this desirable. The policy should include provisions for extension of lines across vacant lots. This requires a decision as to the method of cost sharing. For oversized lines designed to service a large drainage area, a common method is for the government agency (Tribe) to pay the difference in cost between a sewer sized only for the development area and the larger size which will be needed ultimately for the total drainage area.

Service should be based on population density and topography. A number of small sewage treatment plants, such as exists in the Fort Smith area, indicates a lack of coordinated area planning. The practice of constructing many small plants, each designed to serve only its immediate area, is less desirable and often more expensive than a large plant designed to serve the entire drainage area. A comparison of the service area map with the map previously prepared for drainage and soil conditions will be helpful in determining (a) the most logical location for treatment facilities and service areas, and (b) areas where public sewage is most needed due to soil conditions which preclude the proper operation of private septic tanks.

A master plan for sewage showing future needs and facilities is necessary in attacking the problem of residential growth. In areas currently without serious problems, such as Pryor, St. Xavier, and Wyola, such a plan will assist greatly in preventing future problems if now unforeseen growth should occur. Along with the master plan, a long-range financial plan is needed by all reservation communities, in which expenditures are allocated for periods of several years. Both the master plan and the financial plan should be related to other community needs.

A determination of total sewage service costs is useful to compare local system costs with each other and with costs in adjacent areas. With the exception of the Lodge Grass and Fort Smith systems, the Public Health Service has provided for the basic community needs. However, there is no reason to assume that their involvement will continue on to include maintenance and expansion of facilities as their current policy is to turn the basic system over to the local governmental agency (Crow Tribe). When this takes place, it will be necessary to have funds available to improve and maintain and expand the service.

Some communities pay their sewage costs from a general fund supported by ad valorem taxes. In this case, an estimate of average monthly residential costs is needed. In other areas, sewer costs are based upon water use. To utilize this system, a standard water consumption figure must be assumed and used throughout the study area for comparison purposes. About 75 gallons per person per day has proved to be a workable figure in many similar areas. This amounts to about 1,000 cubic feet of water per residence per month.

Under the present governmental structure that exists on the Crow Reservation with the involved relationship between the Federal government and that of the Crow Tribe, it is suggested that the latter system will prove to be the most workable. A special Water and Sewer or Utilities Commission should be established to administer the systems and determine what improvements are to be made. Revenues from water and sewer charges should be deposited to a separate account and the funds only used for maintenance and expansion of the systems. Utility charges should not be used to defray other governmental costs.

Prior to projecting costs involved in the improvements recommended for Crow Agency and Lodge Grass to their existing systems the basic processes involved in sewage treatment should be discussed. A wastewater treatment plant speeds up natural processes of stabilization. A reduction of pollutants in water which might take weeks or days in the receiving water is accomplished in hours in a treatment plant.

Sewage water treatment is of two general types, primary and secondary. In primary treatment solids are allowed to settle out. This reduces pollution by about 25-40 percent. Secondary treatment uses biological process in addition to settling as an additional step to reduce pollution to 85-95 percent.

Primary Treatment may be suitable when the receiving waters are large and swift enough to handle pollutants by natural processes without endangering health or causing odors.

As the wastewater enters the plant, it flows through a bar screen to remove large pieces of material which might clog or damage machinery. A comminutor or barminutor may take the place of the bar screen. These units shred or cut the solid material and it remains in the liquid.

In the grit chamber, sand, grit, cinders, and stones are allowed to settle out. Next, a coarse screen may be used to protect equipment and processes. At this point, a pumping station may be necessary to lift the wastewater into the sedimentation tank. In this tank, remaining solids settle to the bottom or float on top as scum. These solids, called sludge, are removed from the tank by skimming the scum from the top and by pumping the sludge from the bottom of the tank to the sludge digestion tank. In the digester, the sludge is reduced in volume and stabilized by bacterial action which results in material that can be disposed of safely.

While the sludge is digesting, a large volume of gas is produced. This gas contains 60-70 percent methane and has a net heat value of 540-675 B.T.U.'s per cubic foot.

Sludge gas produced by digestion is used in many treatment plants as a source of energy for operating parts of the plant.

Stabilized sludge is periodically drawn off and dried by being spread on drying beds, by centrifuging or by vacuum filters. Dried sludge can then be burned or used as land-fill.

However, there are some problems in disposal and use of dried sludge. The demand for it as fertilizer is limited. When used by homeowners, sludge should be sterilized to protect the public health.

As a final step in primary treatment, the settled wastewater may be passed through a chlorine contact tank where chlorine is added for disinfection. The effluent is then discharged to receiving waters through an outfall sewer.

In Secondary Treatment, certain units are added to the primary treatment plant to treat the settled wastewater from primary sedimentation. These additional units are needed when the receiving waters are small or slow flowing or wastes come from a large population or from an industrial operation. Secondary treatment involves biological processes which oxidize dissolved and finely suspended materials. The basic methods of providing this bioligical treatment are:

Trickling filters. Settled wastewater from the sedimentation tank is distributed over beds of gravel or crushed stone, usually by a rotary distributor. As the wastewater trickles through the stones, it contacts the biological slime which grows on the stones. The organisms in the slime oxidize most of the remaining impurities in the liquid, reducing the pollutional load.

Activated Sludge or Aeration. Settled wastewater from the sedimentation tanks is run through a filter where bacteria act on the dissolved solids and suspended materials.

After this bioligical treatment, secondary sedimentation removes the remaining solids. A portion of the settled solids is returned to the aeration tank to provide the necessary biologically active material. The remainder is pumped to the digestor with the sludge from the primary sedimentation tank for treatment. The final effluent may be chlorinated before discharge.

Since the activated sludge process is more complex, it is more difficult to operate than a trickling filter. The trickling filter, however, is less efficient and requires a larger land area. There are many modifications of these basic processes available for use with particular types of wastes.

The Imhoff Tank combines sedimentation and sludge digestion in a two story tank. This is a common method of primary treatment in small communities because it is cheaper and requires less skilled operation than a standard treatment plant with separate digestion tanks. However, the Imhoff tank is low in efficiency and provides less reliable sludge digestion, particularly in a northern latitude such as where the Crow Reservation is located.

The following chart relates the economic justification of public sewer systems and service in relation to various population densities. The chart does not reflect the justification of public systems from a health standpoint since this cannot be determined except as a judgment factor. The chart should serve as a "rule of thumb" guide for future planning purposes.

Population Density	Equivalent Lot Size	Service Economic Justification
Over 5,000 persons/sq. mi.	Less than ½ acre	Public sewerage is justified
2,500-5,000 persons/sq. mi.	½ to 1 acre	Public sewerage is normally justified
1,000-2,500 persons/ sq. mi.	1 to 2 acres	Public sewerage is not normally justified
Less than 1,000 persons/sq. mi.	Over 2 acres	Public sewerage is rarely justified

SOURCE: U.S. Public Health Service, (HEW)

Costs of Sewer Improvements as presented in this preliminary report should be viewed only as guidelines until the final land use and housing areas are completed under Phase II of the planning process. The scope of sewer improvements developed around the projected population and industrial growth are designed to include a sewage lagoon or new cell on existing facility, outfall lines to the existing or new lagoons, and collection lines and service lines as necessary.

Estimated costs have been made for each of the above improvements as they are applicalbe to the communities and quantity figures have been obtained which are approximate, but we feel adequate for this study. The location of the treatment or collection facilities are only approximate and should not be considered as a final design system. Details have not been attempted as these will probably change when final planning, surveying, and design is made for each community.

For the purposes of this preliminary plan, and the sewer estimation procedures employed, general classifications of improvements are noted. Unit prices are established to cover the general classifications which include:

1. Sanitary Sewer Sewage Lagoon will include excavation, grading, and right-of-way costs.
2. Sanitary Sewer Outfall Lines will include excavation, manholes, pipe, and right-of-way costs.
3. Sanitary Sewer Lateral Collection Lines will include excavation, manhole, and pipe costs.

4. Sanitary Sewer Service Lines will include excavation, tap to main, and service line to property line costs.

Lodge Grass

Addition of a five acre cell to the existing stabilization lagoon	$ 97,470.00
A new 12" outfall line to the new lagoon cell	22,613.00

Crow Agency

Construction of a new 12 acre stabilization lagoon stabilization lagoon near industrial park	$125,529.00
Outfall line to industrial park	29,730.00
Collection lines within industrial park	48,750.00
Total development cost	$324,092.00

The estimated costs as shown above do not include engineering, administration, or contingencies. Approximately 20 percent should be included and added to the costs to obtain overall construction costs for developments.

WATER SYSTEMS

Similar to the variety of sewage disposal methods used on the Crow Indian Reservation, residents obtain their water from several different sources and by several different methods. Rural homes throughout the area obtain their water from shallow to deep wells or by having it trucked in. Indian residents drilled several wells for their individual use by applying a portion of their "Family Plan" funds from the land cession judgment. Other wells were drilled by the Public Health Service under Public Law 86-121. Crow Agency uses water from the Little Big Horn River that is chlorinated, flouridated, and filtered before entering the city system. The Bureau of Reclamation system provides a portion of the Fort Smith residents with their water, while the remainder use water from community wells. Lodge Grass has a city water system that uses well water as its source. Pryor and St. Xavier homes are supplied from individual wells, while Wyola obtains water for its community system from the Little Big Horn River. The water is pumped from the river and is then chlorinated before entering the system.

As previously stated, the rural domestic water supply is obtained chiefly from wells. The quality and quantity of ground water for a given location depends principally on the character of the underlying geological formations as discussed in the "Physiography and Ecology" portion of this report. The sandstone and coal beds of the Fort Union and Lance formations commonly yield a fair to good quality of domestic use water in adequate supply. The supply is limited and the quality generally poor in wells terminating in the Montana and Colorado formations. A few wells drilled in these structures, however, are producing a relatively high quality water. Water is plentiful in the terraces and gravels of the bottom lands of the Big Horn and Little Big Horn rivers, but the quality is variable and the resource is extremely high in mineralization in places. Artesian pressure raises the water considerably in most bedrock drilling locations. Water for irrigation and stock is obtained from the ground and surface resources, dependent upon location.

Water quality and quantity have become important issues throughout the nation within the last decade. This is also true on the Crow Indian Reservation, although its true value as a resource was not really assessed by the residents until the 1,356,000 acre reservoir began to back up behind the newly completed Yellowtail Dam. Water is important as a resource to the Crow Tribe and the Crow Reservation as a whole. With completion of "the dam" renewed interest has been shown in developing the extensive quantities present. More than a cursory interest has been expressed by agricultural groups to expand the acreage under irrigation, industry looks to the water for manufacturing and mining (coal), and the general citizenry wants water for improved community water systems and rural home use.

The Crow Tribe, Bureau of Indian Affairs, Public Health Service, and Big Horn Economic Development Corporation have all investigated various aspects of water use and application within recent years.

Irrigation of the "Hardin Bench," a community water system reaching from Yellowtail Dam to Hardin to Crow Agency, piping of water to the coal fields, and various recreational applications have all been researched, reported, and investigated.

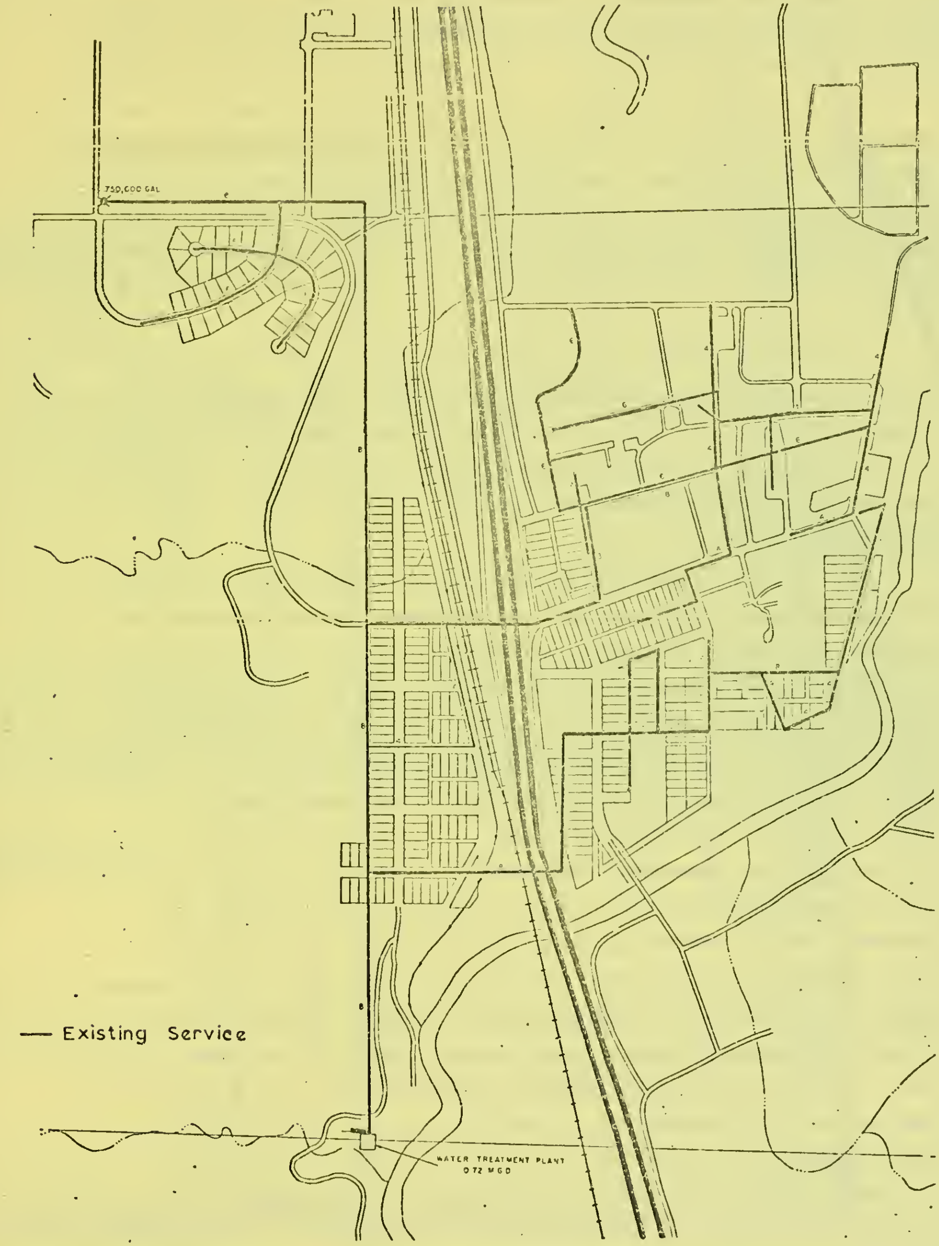
Relative to community and individual water needs two studies are of particular interest to this report--the Comprehensive Water and Sewer Study completed under sponsorship of Farmers Home Administration, and the Water Supply Study for Hardin and Crow Agency funded through a Technical Assistance Grant from the Economic Development Administration.

The FHA study, of which a preliminary report has been made available to this consultant, is valuable from the standpoint of inventory of existing community systems, (1969). Projection of community needs will most certainly differ from the FHA study to this report since this consultant has the recent population counts from the 1970 Census on which to base community increase and decrease factors. Areas projected to increase in population by 1970, in some cases have declined. Where an area was in a marginal status for new or expanded water or sewer service with a projected increase, an actual decline in population reduces the justification as well as the ability of the community to install and maintain the system.

The EDA study is more limited in scope but has proved invaluable in assessing the potential of the St. Xavier-Hardin-Crow Agency triangle.

The Crow Agency water system has undergone a change within the last five years to increase the amount of water available. Up to 1966 the water was obtained from two wells maintained by the Bureau of Indian Affairs. A large brick-lined dug well near the Little Big Horn River was the main source of supply. During extended pumping periods, the water level in the well was lowered and water from the nearby collection gallery was piped to the well to facilitate recharge. It became necessary to flood the area of the gallery during critical water shortage periods to increase the collector recharge capability. The low well capacity and frequent water shortage periods prompted construction of a new source of supply in 1965. The well system, with a production level of about 35 gallons per minute is now used only for standby purposes.

CROW AGENCY



EXISTING WATER UTILITIES

The new system employs a diversion in the Little Big Horn River to the south of Crow Agency to derive the raw water. Water is pumped from the diversion to filter plant chemicals to precipitate the larger and heavier sediments are added. The water is chlorinated then passed through a filter to a clearwell. The filter beds must sometimes be backwashed as often as three to four times a day during periods of high turbidity which decreases the effective water output of the facility. With several changes in components since original construction, the water plant has an operational capacity of about 525,000 gallons per day. The capacity of the plant could be increased approximately 125,000 GPD with changes to piping and other design components.

Water is transported from the clearwell by an 8" line to the 750,000 gallon storage tank located on a hill to the northwest of the community. From this point the water is distributed through a network of 4", 6", and 8" lines to the residential, commercial, and industrial users. Fire hydrants throughout the community are also fed through the same system.

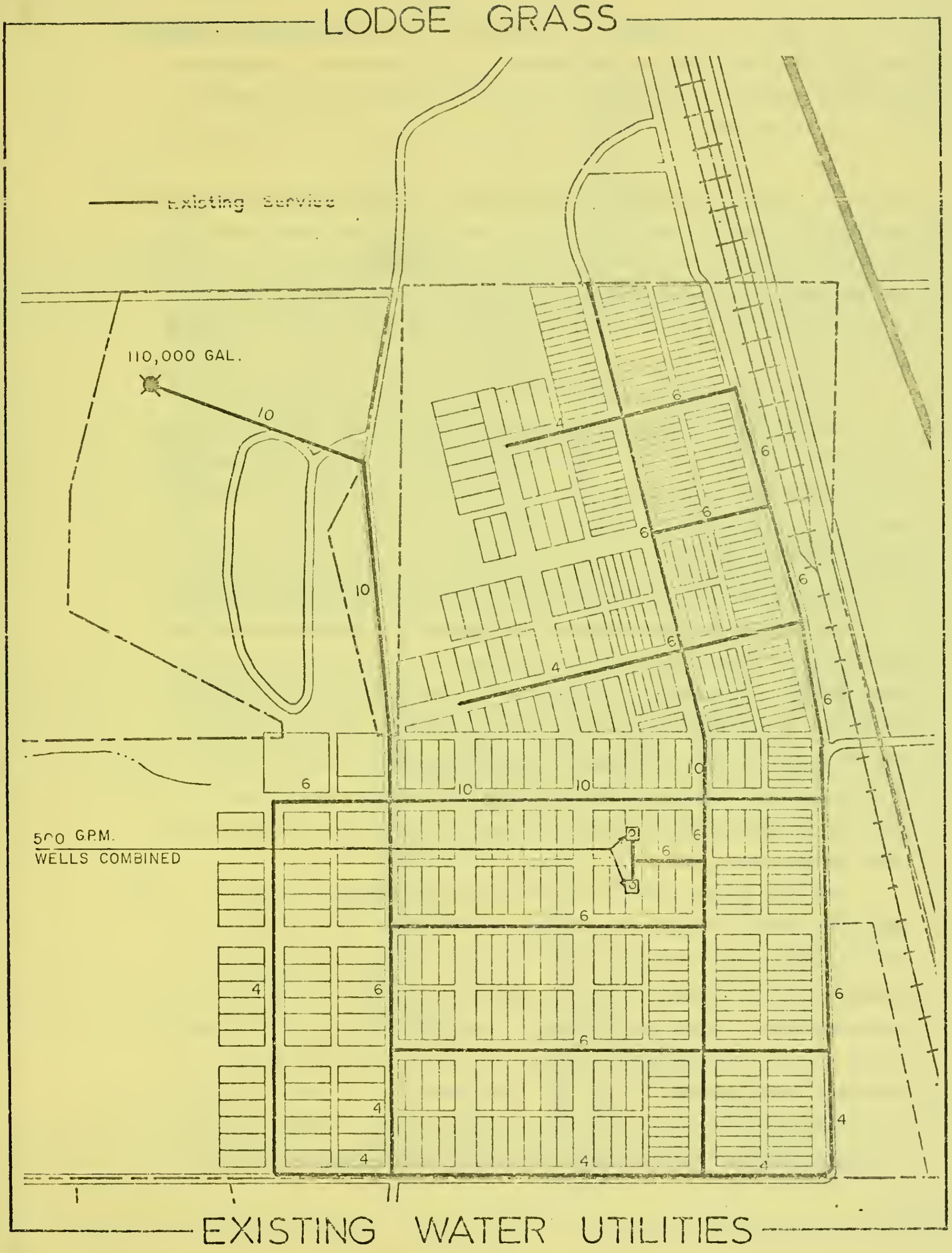
The quantity of water available is sufficient to meet the 245,000 gallon demand of the residential and commercial users. However, the Mohasco carpet mill is in need of 500,000 gallons per day to be able to operate at an economical level. They are presently allocated about 250,000 gallons per work day. Although there is no other industrial use of water at Crow Agency, the principal justification for expansion will not only be to satisfy the needs of Mohasco but to serve as an added attraction for other industry.

Lodge Grass town water was supplied by a single well that tapped the Parkman sandstone formation until 1954 when a second well was drilled. During the summer months when the first well was pumped almost continuously the demand often exceeded the supply. The second well was drilled into the same formation as the first well and is used as a standby well in case of pump failure on the initial supply. It also provides an additional source of supply during high demand periods. The two wells are capable of a combined supply of about 500 gallons per minute.

Water derived from the wells is stored in a 110,000 gallon elevated tank that is located to the northwest of the community. Distribution

LODGE GRASS

EXISTING WATER UTILITIES



to residential and commercial consumers is provided through a network of 10", 6", and 4" mains. Electrolysis has developed in the older steel mains and they are being replaced on a programmed schedule.

No improvements to the Lodge Grass water system are proposed for the five to ten year planning period--other than completion of the projects currently underway. Replacement of the steel pipe has been given the highest priority by the community. A new high-yield well has been drilled to the north of town and the connection of this well to the existing system should provide ample water for the present community as well as any projected growth. This connection will be made during the present fiscal year. Other than these two projects, normal maintenance procedures will be all that is required.

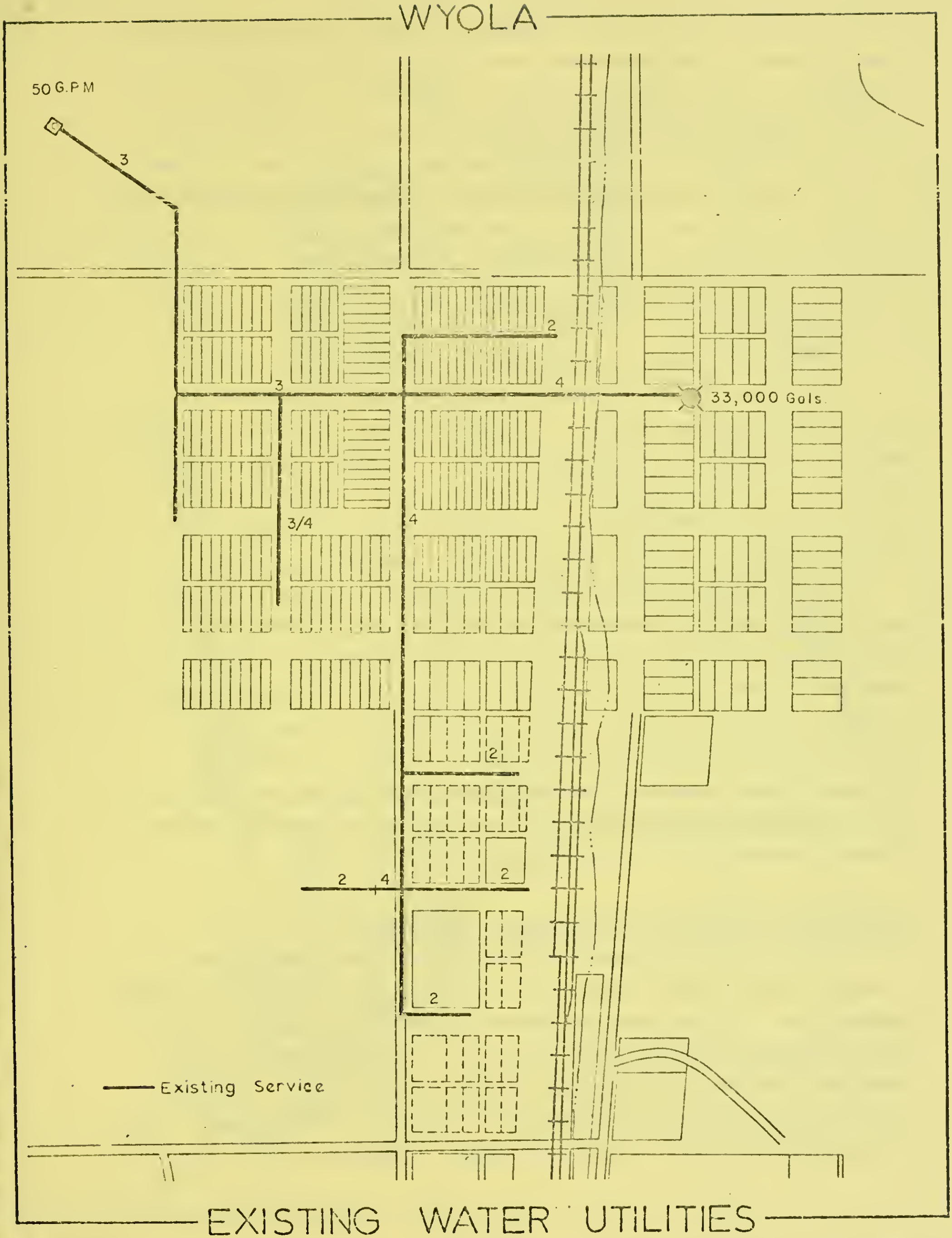
The 96 Wyola residents derive their water from a well dug near the Little Big Horn River. River water shortages have occurred when the river level drops during periods of hot, dry weather and result in the supply of infiltrating water decreasing proportionately. The well produces about 50 gallons per minute when adequately ground water is present which provides adequate water for the present population.

Pumped water is chlorinated and stored in a 33,000 gallon tank located on the east side, of highway 87. If filled to capacity, the tank provides residents with a three to four day supply during dry periods. Distribution to residents is through a network of 2", 3", and 4" water mains. To insure a continuous supply during summer months a new deep well should be drilled. Water bearing formations are present in depths of 30' to 100' throughout the area so minimal expense will be involved.

The Fort Smith water supplies were constructed to enable the large concentration of residents present during the building of Yellowtail Dam to have ample supplies. With the much reduced population now living within the service areas, several times the required amounts are available. Three separate water systems exist in the Fort Smith area, and the service areas for each correspond with those of the sanitary sewer systems previously described.

The government area is supplied through water pumped from the Big Horn River to the northwest of the developed area. Although

WYOLA



EXISTING WATER UTILITIES

precise design capacity of the pump and treatment plant have not been made available to the consultant, pre-construction specifications provide for a population of 750 plus contractor uses. Storage is provided in an estimated 150,000 to 200,000 gallon tank located to the south of the area. Distribution is provided through 8" and 6" mains.

The trailer park located to the north of Highway 313 just outside the Bureau of Reclamation line is provided water from a 40 gpm well that supplies reserves to a 100,000 gallon elevated tank. More than adequate distribution is provided through 4" and 2" water lines. No improvements or expansion of the system will be necessary through the five to ten year planning period.

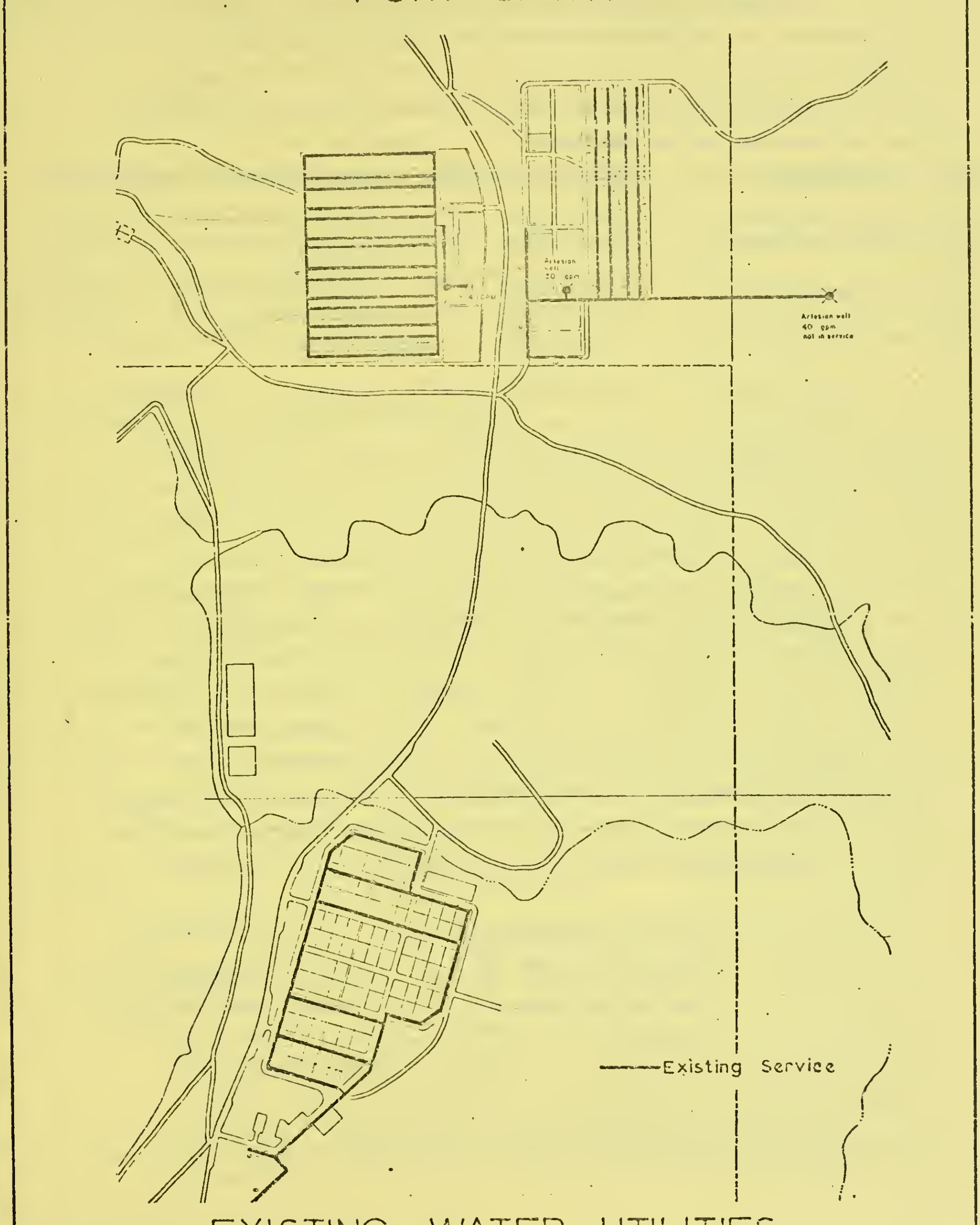
To the south of the highway a third system of 4" and 6" water mains brings water to residents of the subdivision. Two artesian wells with extremely high ratings provide water under pressure for the service area. At the present time the well to the south of the built up area is valued off from the system and is maintained only as an auxillary facility. The system is entirely adequate.

Private wells provide St. Xavier and Pryor residents with their water needs. The wells appear to be providing adequate quantities of water although that of the St. Xavier area is rather hard. Wells in both areas range in depth from 20 to 50 feet. The St. Xavier population is widely dispersed and as a result a community water system would not be practical. Pryor is more concentrated than St. Xavier but similar to that community. Declining population reduces the feasibility of a central water system. No improvements are proposed for St. Xavier or Pryor during the planning period.

Water System Standards and Recommended Improvements

Public water supply should be provided to those areas of the reservation where service can be justified from either health or economic standpoints. In evaluating the communities of Crow Agency, Fort Smith, Lodge Grass, Pryor, St. Xavier, and Wyola, the consultant compared the water service maps to the present population concentrations and then to future growth areas and projections. The percentage of homes served in each population group was thereby determined.

FORT SMITH



EXISTING WATER UTILITIES

The standards provided by the Public Health Service in their "Environmental Health Planning Guide" were utilized to determine feasibility of service. The guidelines as outlined below, are based upon the average cost of public and private water supplies as compiled from various journals and reports:

Population Density	Equivalent Lot Size	Service Economic Justification
Over 2,500 persons/sq. mi.	Less than 1 acre	Public water supply is justified
1,000 2,500 persons/sq. mi.	1 to 2 acres	Public water supply is normally justified.
500 1,000 persons/sq. mi.	2 to 4 acres	Public water supply is not normally justified.
Less than 500 persons/sq. mi.	Over 4 acres	Public water supply is rarely justifi

The policies of the Montana Public Service Commission as they relate to utilities and capital investment-financial return were also taken into account in determining the necessity for public supply improvements. Local characteristics of each community were also examined for any indication that an adjustment in the criteria was necessary. However, it was established that the guidelines were suitable as a general guide in determining the economic justification of public water service.

A community utility system is preferable to a multiplicity of uncoordinated systems such as occurs in both water and sanitary sewer at Fort Smith. A number of small water systems is often the result of a lack of coordinated policy for community water resources. Often insufficient capacity, differing rate systems, and deficient fire protection can be traced to multiple systems and illustrate the desirability foh a coordinated service plan. At Fort Smith, where the condition occurs, interconnection between the distribution lines of the three systems is recommended.

A master plan for water supply which shows future needs and facilities in relation to the area's growth and water resources is necessary for effective planning. In the preceeding narrative the consultant has identified existing problems and those which are projected to occur over the next five to ten years. As the development plans for the individual communities are provided under Phase II of the planning program more precise recommendations will be possible. The final water systems plan will be developed in connection with the sanitary

SEWER PLANS AND WILL ENCOMPASS LONG RANGE WATERSHED NEEDS, STORAGE FACILITIES, TREATED WATER STORAGE NEEDS, AND OTHER DEMANDS WILL ALSO BE CONSIDERED.

EACH COMMUNITY WITH PUBLIC WATER SYSTEMS SHOULD HAVE A DEFINITE POLICY FOR DETERMINING THE METHOD TO BE EMPLOYED IN MAKING SERVICE EXTENSIONS. WHERE THE SYSTEM IS OWNED BY A PRIVATE INDIVIDUAL, SUCH AS AT FORT SMITH, EXTENSIONS ARE DICTATED LARGELY BY ECONOMIC FACTORS. WHERE THE SYSTEM IS PUBLICLY OPERATED, THERE SHOULD BE A CLEAR-CUT PROCESS TO GOVERN EXTENSIONS WITHOUT THE EXISTING "RED TAPE" AND BUDGETING PROBLEMS ON THE PART OF THE GOVERNING AGENCY OR AGENCIES. WHERE VACANT AREAS MUST BE CROSSED OR WHERE THE PIPE NETWORK CALLS FOR OVERSIZED LINES, A POLICY SHOULD BE ESTABLISHED DESCRIBING SPECIAL CONSUMER/UTILITY FINANCIAL ARRANGEMENTS.

STILL ANOTHER FACTOR NEEDED FOR A GOOD WATER UTILITY PROGRAM IS A LONG-RANGE FINANCIAL PLAN. BOTH THE MASTER PLAN AND THE CAPITAL BUDGET SHOULD BE RELATED TO OTHER COMMUNITY NEEDS. ALTHOUGH NO SINGLE FIGURE CAN BE PROVIDED AS A "REASONABLE" WATER RATE AND STILL MEET THE DEMANDS OF EACH COMMUNITY, THE COSTS OF WATER SHOULD BE FAIRLY CONSISTENT THROUGHOUT THE RESERVATION. IN SOME COMMUNITIES WITHIN THE REGION, WATER RATES ARE TOO LOW TO ALLOW SOUND FISCAL PLANNING FOR DEPRECIATION OR ANTICIPATED EXPANSION NEEDS. IN OTHER AREAS, WATER RATES ARE SET HIGH ENOUGH TO GIVE A SURPLUS THAT IS DIVERTED TO NON-UTILITY USES. A THOROUGH STUDY OF RATE STRUCTURING WOULD BE DESIRABLE TO PROVIDE SOUND SERVICE RATES AND TO AVOID BOTH OF THE ABOVE PRACTICES.

BASED UPON A STUDY COMPLETED BY THE PUBLIC HEALTH SERVICE AND BUREAU OF INDIAN AFFAIRS INTO RATE STRUCTURING ON THE RESERVATION THE FOLLOWING SCHEDULE IS PRESENTED AS A MODEL ONLY:

USE QUANTITY	BASE CHARGES (MONTHLY)
0-10,000 GALLONS	.50 PER 1,000 GALLONS
NEXT 10,000-20,000 GALLONS	.48 PER 1,000 GALLONS
NEXT 20,000-50,000 GALLONS	.46 PER 1,000 GALLONS
OVER 50,000 GALLONS	.45 PER 1,000 GALLONS

MINIMUM MONTHLY BILLING OF $3.

THE SCHEDULE TAKES INTO CONSIDERATION ADMINISTRATION AND MAINTENANCE COSTS, WATER TREATMENT, STORAGE TANKS, AND DISTRIBUTION LINES and a fund for replacement of deteriorating components. It will, in addition, allow for accepted public water supply standards in the following areas to be met:

A. Quality: Meets Montana State Board of Health and United States Public Health Service standards

B. Quantity: Sufficient water for projected growth plus a reserve for dry periods

C. Treatment:
    1. Adequate capacity to meet maximum daily demand and the requirements of fire hydrant systems
    2. Provision for expansion in stages
    3. Adequate to meet state and federal treatment requirements

D. Distribution System:
    1. Storage facilities where they are needed
    2. Maximum system pressure of 40 psi
    3. Proper design to insure complete coverage of local service area and to assure required flow delivery

Regulations calling for mandatory connection to public water supplies where public water service is, or could be made available, are recommended to allow better system planning and financing. However, the rates should be low enough to encourage connection to the public supply.

The aggregate of future water system investments is necessarily dependent upon the population growth and the desired densities. The consultant has noted the communities that are in need of additional facilities within the five to ten year planning period. The new well recommended for Wyola and the interconnection of systems at Fort Smith require no further explanation. However, two separate methods could be used to solve the water shortage problem at Crow Agency.

One method would simply involve expansion of the intake and treatment facilities or construction of a second system of approximately the same specifications adjacent to the first. (Alternative A)

A second method, and one that has been explored to some extent under an Economic Development Administration Technical Assistance Grant, is to provide adequate supply for Hardin and the area between Hardin and St. Xavier with drinking water in addition to water for Crow Agency.

REQUIRED WATER USE FOR DOMESTIC AND FIRE FLOW

		QUANTITIES OF WATER	POPULATION DENSITY* IN DWELLING UNITS PER ACRE				
			0-1	1-2.9	3-4.9	5-15	15 AND OVER
		Average Daily (gpcd)	300	225	190	150	125
		Acre Ft. Use per 1000 Population**	.92	.69	.58	.46	.38
		Maximum Daily gpcd Use***	900	675	570	450	375
		Maximum Daily Acre Feet/1000***	2.76	2.07	1.74	1.38	1.14
Requirement Per 100 of Residential Development		Average Day--1000 gal.	57	171	253	455	950
	Daily	Average Day--Acre Ft.	.18	.53	.78	1.40	2.92
		Maximum Day--1000 gal.	171	513	759	1365	2850
		Maximum Day--Acre Ft.	.54	1.59	2.34	4.20	8.76
	Annual	1,000,000 Gal.	21	62	92	166	346
		Acre Ft.	64	190	282	512	1065
		Acre Ft. per 100 Population Total Annual Requirements	335	252	212	168	139

*Assumes 3.8 persons per dwelling unit

**One acre-foot equals 325,830 gallons

***Maximum daily consumption equals three times average daily consumption

PLANNING GUIDE FOR WATER USE

TYPES OF ESTABLISHMENTS	GALLONS PER DAY
Airports (per passenger)	3-5
Apartments, multiple family (per resident)	60
Camps:	
Construction, semipermanent (per worker)	50
Day with no meals served (per camper)	15
Luxury (per camper)	100-150
Resorts, day and night, with limited plumbing (per camper)	50
Tourist with central bath and toilet facilities (per person)	35
Dwellings:	
Boardinghouses (per boarker)	50
Additional kitchen requirements for nonresident boarders	10
Luxury (per person)	100-150
Multiple family apartments (per resident)	40
Single family (per resident)	50-75
Hospitals	250-400
Jails and Other Institutions	75-125
Laundries, self-serviced (gallons per washing; i.e., per customer)	50
Livestock (per animal):	
Cattle (drinking)	12
Dairy (drinking and servicing)	35
Goat (drinking)	2
Hog (drinking)	4
Horse (drinking)	12
Mule (drinking)	12
Sheep (drinking)	2
Turkeys (per 100)	10-18
Chickens (per 100)	5-10
Motels with bath, toilet, and kitchen facilities (per bed space)	50
With bed and toilet (per bed space)	40
Parks:	
Overnight with flush toilets (per camper)	25
Trailers with individual bath units (per camper)	50
Picnic:	
With bath houses, showers, and flush toilets (per picnicker)	20
With toilet facilities only (gallons per picnicker)	10
Restaurants with toilet facilities (per patron)	7-10
Without toilet facilities (per patron)	2½-3
With bars and cocktail lounge (additional quantity per patron	2
Schools:	
Day with cafeteria, gymnasiums, and showers (per pupil)	25
Day with cafeteria but no gymnasiums or showers (per pupil)	20
Day without cafeteria, gymnasiums, or showers (per pupil)	15

PLANNING GUIDE FOR WATER USE

(continued)

TYPES OF ESTABLISHMENTS	GALLONS PER DAY
Service stations (per vehicle)	10
Stores (per toilet room)	400
Swimming pools (per swimmer)	10
Workers:	
Construction (per person per shift)	50
Day (school or offices per person per shift)	15

SOURCE: Environmental Health Practice in Recreational Areas, Public Health Service.

Under this method water is to be pumped from the Big Horn River. The Hardin to St. Xavier area is not a good area for wells as the formations produce extremely hard water that is potable but not palatable. As a result, most residents in this area have their water trucked in. (Alternative B)

Some discussion of the second alternate is in order since the systems developed by the EDA consultant, or a combination of the four separate proposals, has the potential of not only solving the treated water problems of the triangular area but can provide water for industry and possibly even irrigation. The problems of the area are:

1. A water shortage at Hardin within the next ten years
2. Lack of potable water between Hardin and St. Xavier
3. Shortage of water at Crow Agency
4. Shortage of irrigation water from Crow Agency to Hardin

Large volumes of water are available at the Yellowtail Dam or directly from the Big Horn River at any point between the dam and the Hardin community. The greatest demand for good quality water is at Crow Agency and Hardin, and to a lesser degree the land along the Big Horn to the south of Hardin.

After consideration of the four EDA plans a fifth plan is offered which could solve all problem areas. Under this plan water would be pumped from the diversion near St. Xavier to the summit of the hill between the Big Horn and Little Big Horn rivers utilizing a pump with a head of about 290 feet to force the water through the 14" supply line. Over the summit the upper reaches of several small tributaries of the Little Big Horn River offer potential for a large holding reservoir for the raw water. Shoulder Blade Creek and Onion Creek appear to hold the greatest potential. From the holding dam with a minimum capacity of 10,000 acre feet (about 3¼ billion gallons). From this point ample water would be available for irrigation uses along the upper terraces as well as providing an economical supply for the treated water system.

The treatment plant would contain facilities for clarification, filtering, softening and chlorination. After treatment the water would be pumped for less than ¼ mile to the summit. From this point gravity flow lines would deliver the water to the Crow Agency reservoir and to the Lower Big Horn Valley area and the city of Hardin.

Estimated costs have been made for each of the recommended improvements to water systems on the Crow Indian Reservation. The quantity figures given are approximate as they are not the result of a detailed engineering study. However, the consultant feels they are adequate for this preliminary report. Details have not been attempted as these will probably change when final planning is complete for the individual communities under Phase II of the planning program.

Unit prices are established to include:

1. Water Collection Gallery includes excavation, gallery development, pumps, and pipe costs.
2. Water Storage Reservoir includes excavation, reservoir, and controls
3. Water Transmission Mains include excavation, manholes, controls, valves, hydrants, and pipe costs
4. Water Distribution Mains include excavation, fittings, valves, hydrants, and pipe costs

CROW AGENCY (ALTERNATIVE A)

WATER TREATMENT PLANT ADJACENT TO EXISTING FACILITY	$ 252,500

CROW AGENCY (ALTERNATIVE B)

16" PIPELINE--RIVER TO PUMP STATION	$ 10,400
PUMP STATION (290 FOOT HEAD)	50,000
14" PIPELINE--PUMP STATION TO SUMMIT	525,000
12" PIPELINE--SUMMIT TO STORAGE RESERVOIR	5,000
TREATMENT PLANT AND PUMP STATION	375,000
100,000 GALLON EQUALIZING RESERVOIR	28,000
10" TRANSMISSION MAIN TO CROW AGENCY (GRAVITY)	425,000
10" TRANSMISSION MAIN TO HARDIN VIA BIG HORN VALLEY (GRAVITY)	1.200,000
10,000 ACRE FEET STORAGE RESERVOIR	328,000
	$2,946,400

FORT SMITH

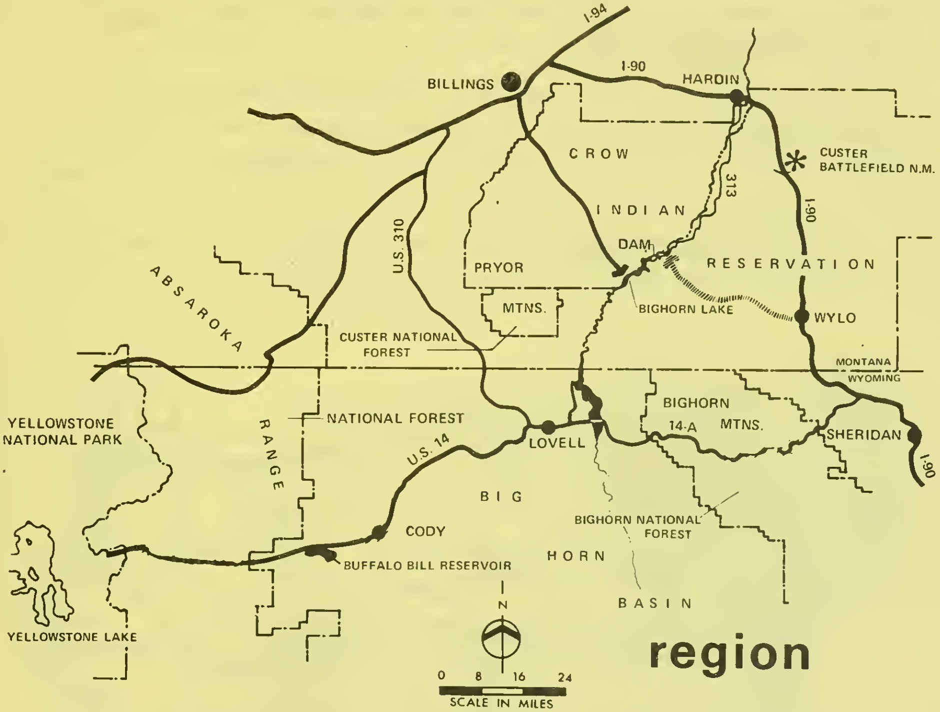
6" WATER LINE (INTERCONNECT SYSTEMS)	$ 18,250

WYOLA

DRILL WELL (50' TO 100' DEEP)	$ 1,000
INTERCONNECT SYSTEMS 4"	4,700
	$ 5,700

ROAD TRANSPORTATION SYSTEM

Transportation facilities and needs on the Crow Reservation are complex due to the large geographic divisions on the Reservation ranging from mountain ranges to farm and ranch land. Likewise, the collective size of the Reservation and the scattered family units cause additional problems.



To analyze the problems and needs this report is divided into three sections which are as follows:

1. Montana highway and Big Horn County highway statistics:
   - (A) Traffic counts and Visitor Information
   - (B) Highway conditions
2. Local travel information.
3. Transportation needs.

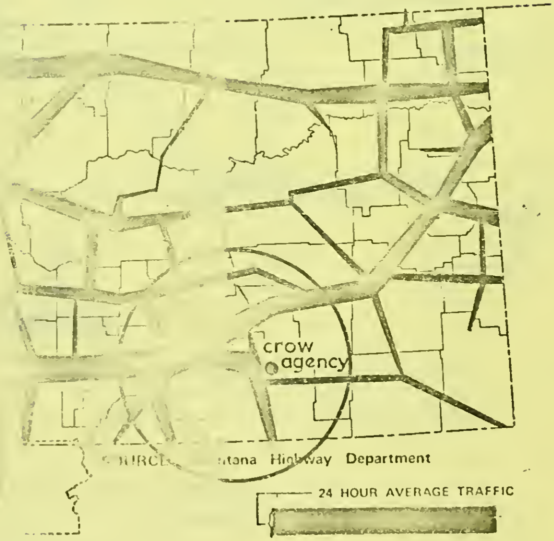
[illegible] UNITY [illegible] ISTICS:

[illegible] RMATION

[illegible] LLY SERVED BY [illegible] TERSTATE HIGHWAY 90 [illegible] D CONNECTING [illegible] T OF THE MAJOR [illegible]. INTERSTATE [illegible] RUNS FROM BILLINGS [illegible] LODGE GRASS. [illegible] CROW AGENCY MONTANA [illegible] SOUTH DAKOTA [illegible] THE BLACK HILLS AREA. [illegible] RUNS NORTH TO [illegible] TER WHERE IT CONNECTS [illegible]

[illegible] NNING AREA PRIMARILY FOLLOWS THE [illegible] ON THE DRAWING BELOW WHICH INDICATES [illegible] W WITHIN THE STATE OF MONTANA.

[illegible] THIN THE STATE OF MONTANA

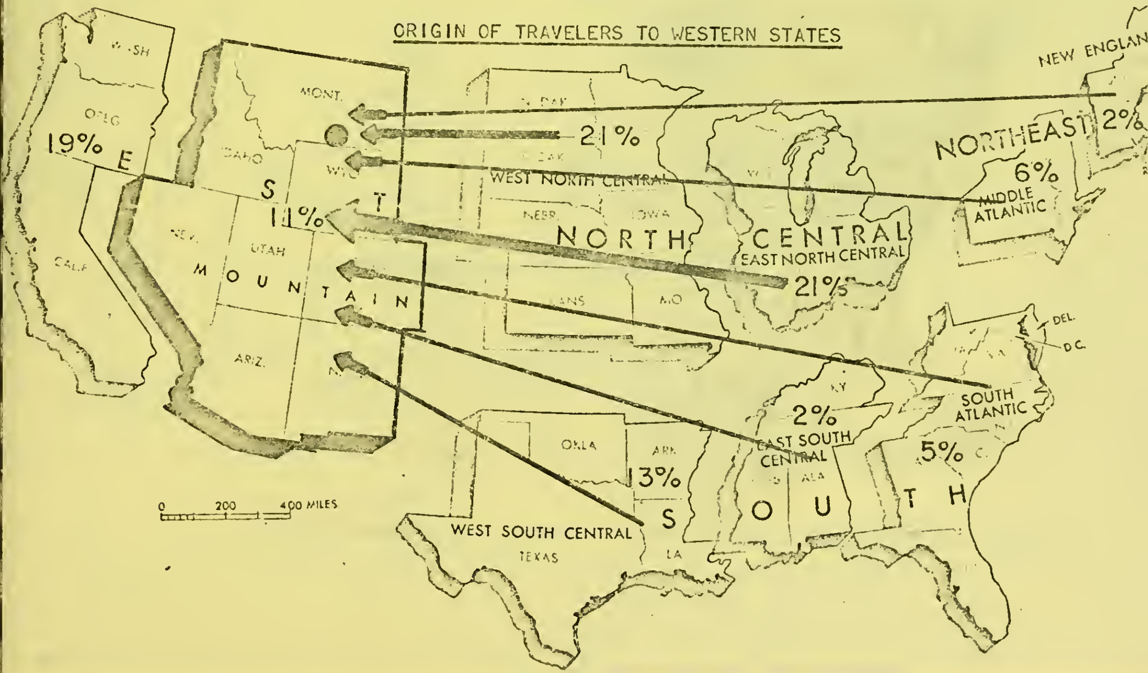


SOURCE: Montana Highway Department

To understand the travel pattern of the out-of-state tourist we first must start with the overall traffic into the Western states, its pattern, where the travelers come from, what they expect to do in the area, etc. This is of particular interest to the planning area because of the potential for tourism and the economic need associated with attracting the tourists.

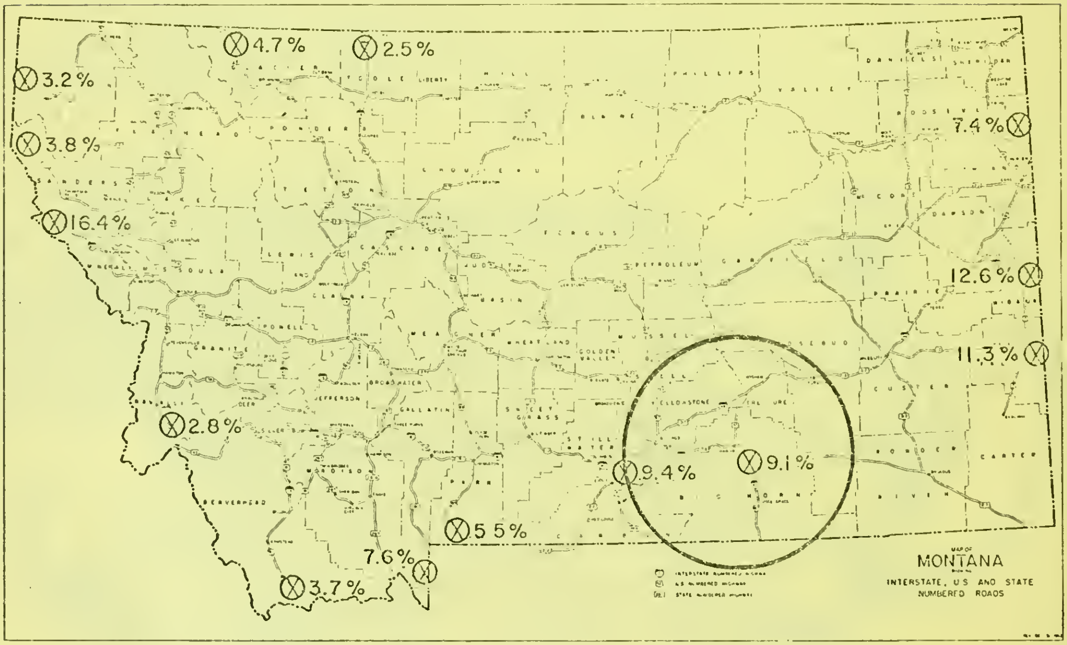
In 1966, the Better Homes and Gardens magazine conducted a comprehensive study of the area to help determine the profile of the Western traveler, as well as his origin and destination. Results of this study illustrated an intense interest in family travel with the Western and Southern states determined the most popular vacation areas.

A close look at the study and the 18% of the respondents who vacationed and spent their most memorable vacation in the past five years in the Western states shows that they came to the area from all over the country. This is illustrated on the flow map below. It is noteworthy that over 70% of the respondents came from outside the Western state area and that over 4% said that Montana appealed to them the most.


ORIGIN OF TRAVELERS TO WESTERN STATES

The following chart shows the percentage of out-of-state traffic entering Montana at the various border stations and traveling from Idaho, Canada, North Dakota and South Dakota. As can be seen, the out-of-state travelers at the intersection of Highway 212 and Interstate 90 located at Crow Agency is 9.1%.

PERCENTAGE OF OUT-OF-STATE TRAFFIC ENTERING AT VARIOUS BORDERS



Source: Average Daily Traffic Count, Montana Highway Commission.

The specific tourist interest in the area is indicated by the visitor interest in the major tourist centers located on the Crow Reservation. The visitor count to these areas is shown below.

CUSTER BATTLEFIELD

YEAR	VISITOR COUNT*
1940	60,000
1950	73,000
1960	146,000
1961	150,000
1962	179,000
1963	175,000
1964	188,000
1965	190,000
1966	218,000
1967	260,000 (Year of Seattle World's Fair)
1968	238,000
1969	253,000
1970	263,000
1971	To date the average visitor count since 1971 is 2% above 1970, with June visitors reaching 9% above the norm.

* Rounded to the nearest 1,000

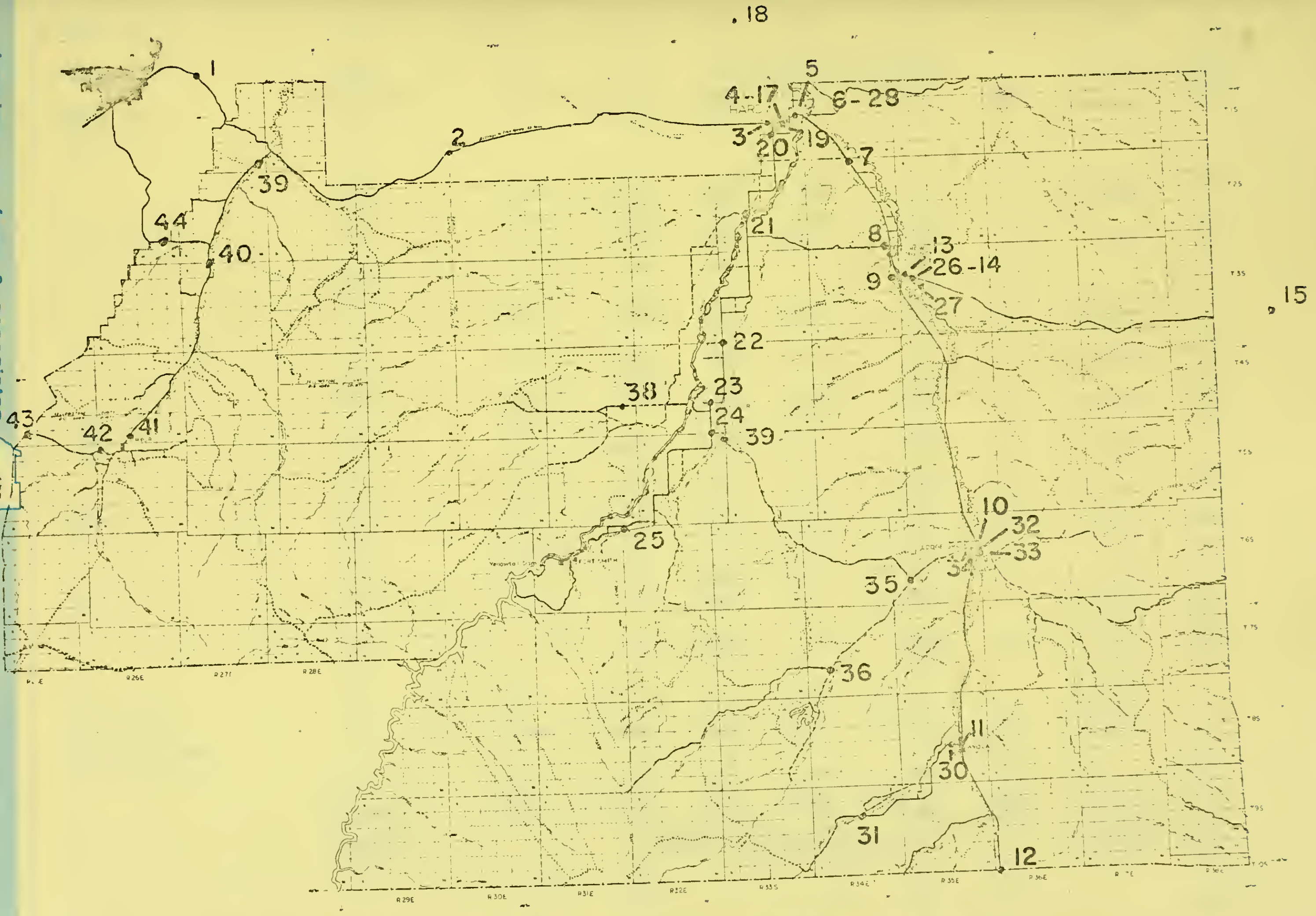
BIG HORN DAM AND RECREATION AREA

1968	191,728 - First year of record taking
1969	146,210
1970	154,049
1971	To date the average visitation is approximately 2½% behind last year. This drop is attributed to lack of facilities on the lake and in the area.

A further breakdown of the Big Horn Recreation area visitor days indicates the following forms of useage: based on 1969 travel totals.

ACTIVITY		MEASUREMENT Big Horn Recreation area
Visitation	V-Days	146,210
Sightseeing	V-Days	1,340
Picnicking	V-Days	10,030
Camping	V-Days	2,800
Swimming	V-Days	330
Waterskiing	V-Days	13,100
Boating	V-Days	9,650
Fishing	V-Days	22,500
Hunting	V-Days	
Other	V-Days	380
Total Visitation	V-Days	206,340
Peak Day Visitation	V-Days	3,300
Cars	V-Days	38,800
Distribution of Vis.		
Local	%	72
Other	%	28
Watercraft Use		
Boat Days	No.	2,900
Powerboats	No.	2,800
Rowboats and Sailboats	No.	100
Peak Day Use	No.	151
Powerboats	No.	140
Rowboats and Sailboats	No.	11

Traffic in the planning area is comprised of local traffic and interstate travel. Travel counts in the planning area are presented on the following pages. Information given was obtained from the Montana Highway Department, other than count locations 38 thru 44 which are county roads on the Reservation. The information for these roads was obtained by Harrison G. Fagg & Associates.



TRAFFIC COUNT STATIONS

TABLE 1

	COUNT LOCATIONS	AVERAGE 24-HOUR TRAFFIC						CURRENT VEHICLE MILES
		1941	1951	1961	1968	1969	1971*	
INTERSTATE 90 (U.S. 87)	1	441	1,018	1,798	2,147	2,134		52,678
	2	394	751	1,289	1,891	1,826		40,570
	3			3,517		4,728		2,364
	4			4,237		5,163		2,628
	5	689	1,480	2,418	3,527	3,650		6,074
	6	578	1,227	1,910	2,608	2,677		13,588
	7	545	1,158	1,802	2,436	2,459		14,602
	8	568	1,206	1,877	2,446	2,470		4,234
	9	420	838	1,178	1,339	1,361		26,169
	10	426	680	918	1,173	1,176		15,964
	11	351	560	756	1,063	1,112		10,010
	12							
U.S. 212	13	90	169	736	1,205	1,190		324
	14	60	112	488	673	603		14,887
	15							
MONT 47	16			1,487		1,585		1,052
MONT 47	17	189	246	379	408	445		9,806
MONT 47	18	86	108	128	208	209		1,446

	COUNT LOCATIONS	1964	1965	AVERAGE DAILY TRAFFIC 1966	1967	1968	1969	1971	CURRENT VEHICLE MILES
313	19								
	20	1,174	1,028	787	783	811	815		5,785
	21	926	723	623	562	552	553		6,085
	22	874	732	502	508	580	582		2,451
	23	721	706	411	358	477	480		5,104
	24	475	453	283	247	245	247		1,087
	25	856*	745*	540*	503*	547*	549*		20,512*
342	26	209	250	238	247	270	284		249
	27	209*	250*	238*	247*	270*	284*		249*
384	28	176	170	182	188	209	188		2,909
	29	57	61	57	53	62	66		646
418	30	137	151	153	164	157	161		1,710
	31	137*	151*	153*	164*	157*	161*		1,710*
	32								
463	33	392	443	401	351	1,021	1,087		96
	34	271	307	256	263	294	301		1,445
	35	98	105	120	124	125	119		952
	36	46	40	41	36	31	34		935
	37	84*	85*	83*	81*	82*	85*		3,428*

COUNT LOCATIONS	1964	1965	AVERAGE DAILY TRAFFIC 1966	1967	1968	1969	197[illegible]	CURRENT VEHICLE MILES
38							44	
39							210	
40							165	
41							6[illegible]	
42							93	
43							79	
44							53	

HIGHWAY CONDITIONS

To comply with the provisions of the State Financial District Law, the Montana State Highway Commission has the responsibility to evaluate the condition of the Primary System throughout the State for the purpose of allocating construction funds to the various financial districts. To rate the Montana Highways, a procedure called the sufficiency rating procedure was developed by the Montana Highway Department. The sufficiency rating procedure applies only to rural section of Primary System highways. It is not adaptable to urban sections of highway because of the special traffic capacity conditions encountered in the cities. For this reason, the urban sections of highway continue to be rated on the basis of an older formula until such time as a new urban sufficiency rating procedure is designed.

To rate the highway system in Montana the following procedure was used. A completely adequate section of rural highway is assigned 100 points in the sufficiency rating formula. As defined for this study, a section of highway meriting a rating of 100 points must have a thoroughly sound structure, to be free from those hazards that can be eliminated by proper road design and must have adequate capacity to satisfactorily handle existing traffic demands.

The following factors were considered in the sufficiency formula.

- A. Structural Adequacy: Total 50 points
  - 1. Foundation 10 points
  - 2. Surface 30 points
  - 3. Drainage 10 points
- B. Safety: Total 20 points
  - 1. Number of stopping sight distances, shorter than permitted by design speed.
  - 2. Number of horizontal curves, sharper than permitted by design speed.
  - 3. Number of bridges narrower than the width of the traveled-way of approaches.
  - 4. Average accident rate during the last five years.
- C. Hourly Service Volume (Traffic Capacity): Total 30 points
  - 1. Design hour traffic volume for the current year.
  - 2. Pavement and shoulder widths.
  - 3. Percent of commercial vehicles.

4. Length of no passing zones.
5. Design speed.
6. Average highway speed.

Structural adequacy was determined by a field inspection of the entire system. To insure uniformity, this inspection was made by one man who had been schooled in rating techniques. Field measurements of pavement and roadway widths were also made during this inspection, as a check on existing records. The foundation of a section of highway was assigned points in the field between a maximum of 10 if it was considered adequate, and 0 if it was inadequate. Surfacing was rated and assigned 30 points if excellent and 0 if extremely poor. Drainage was also assigned points between 10 and 0 in the same manner as foundation and surfacing.

Factors affecting the safety rating, such as inadequate stopping sight distances, narrow bridges, and excessive horizontal curves, were obtained from the road plans and straight line diagrams. The traffic accident rate for the past five years was computed for each section on the basis of the number of accidents per 10,000 vehicle-miles of travel. A maximum of 20 points for safety was assigned to a section of highway if stopping sight distances were adequate, there were no excessive curves or narrow bridges, and the five year accident rate was below average. Conversely, the safety rating was reduced proportionately from 20 to 0 points by existence of any of these items.

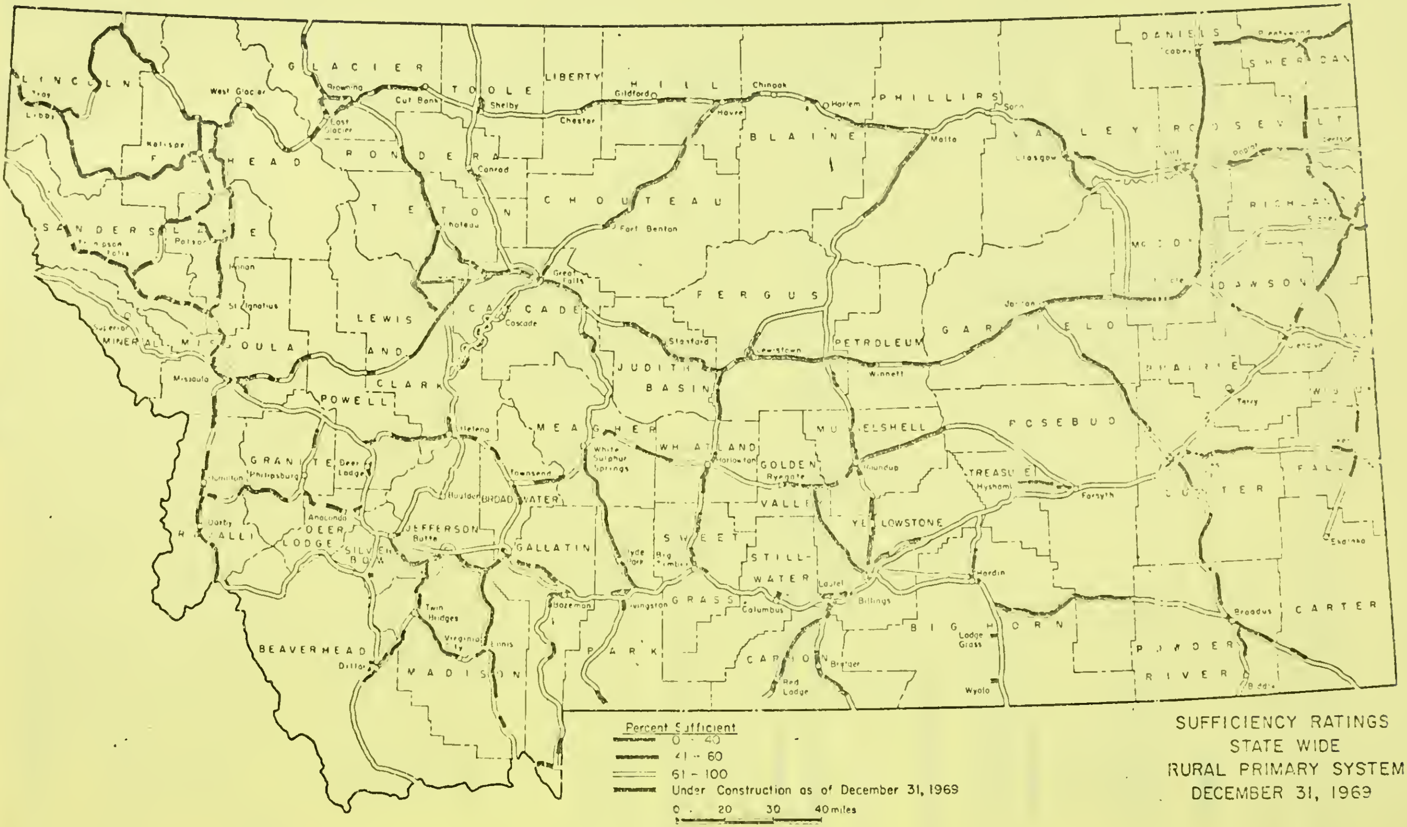
The hourly service volume (traffic capacity) of each section of rural highway has been computed by the approved method for rural highways outlined in the new Highway Capacity Manual. This method takes into consideration such items as width of pavement and shoulders; percent of trucks; length of no passing zones; and design and average highway speeds.

The capacity rating expresses the relationship between the traffic volumes presently using the section of road and the ability of the section to accommodate such traffic. A full rating of 30 points indicates that present traffic demand is less than one-thirtieth of a volume that would restrict operating speeds below a desired level. A rating of 10 or lower would signify a critical deficiency and indicate that the thirtieth-highest hourly volume is greater than a volume that would permit free flow at the desired speed.

A TOTAL BASIC SUFFICIENCY RATING OF A SECTION IS THE SUM OF THE FOLLOWING INDIVIDUAL RATINGS.

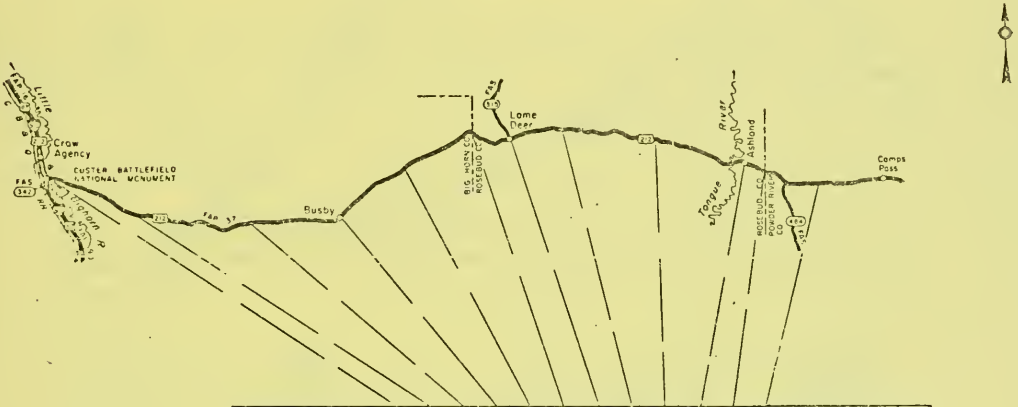
ITEM	RANGE OF POINTS
FOUNDATION	0 TO 10
SURFACE	0 TO 30
DRAINAGE	0 TO 10
SAFETY	0 TO 20
CAPACITY	0 TO 30
TOTAL RATING	0 TO 100

THE MAP ON THE FOLLOWING PAGE INDICATES THE SUFFICIENCY RATING OF THE RURAL PRIMARY ROADS IN MONTANA.

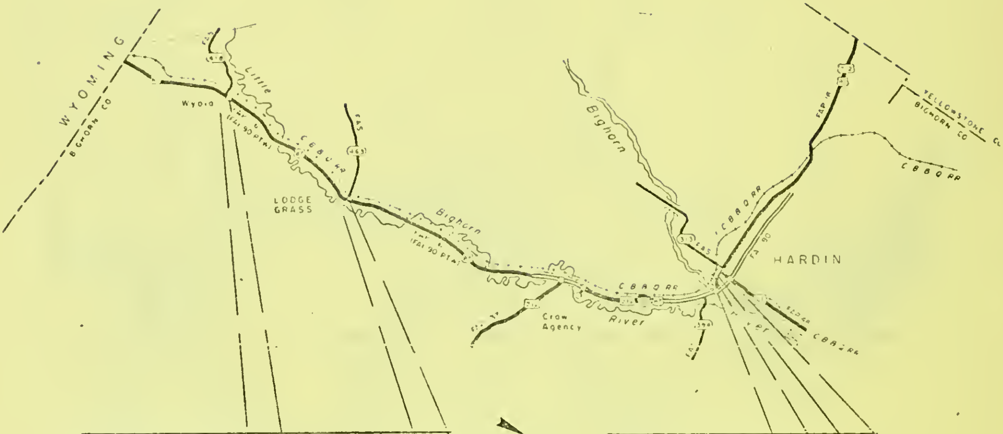


SUFFICIENCY RATINGS
STATE WIDE
RURAL PRIMARY SYSTEM
DECEMBER 31, 1969

THE MAPS AND TABLES ON THIS PAGE AND THE FOLLOWING PAGE INDICATES THE MILES OF RURAL HIGHWAYS IN EACH FINANCIAL DISTRICT BY ADJUSTED SUFFICIENCY RATINGS. THE DRAWINGS AND ALL INFORMATION GIVEN WAS OBTAINED FROM THE MONTANA HIGHWAY DEPARTMENT.



BEGINNING MILE POST	0.0	7.9	17.2	24.5	32.5	38.7	42.3	46.5	53.6	62.3	64.3	BEGINNING MILE POST
LENGTH	7.9	9.3	7.3	8.1	6.1	3.5	4.2	7.1	8.7	2.0	5.3	LENGTH
YEAR BUILT	37	38	38	39	41	41	48	50	50	48	40	YEAR BUILT
YEAR IMPROVED	54	54	54	54	54	54	54	54	54	57	57	YEAR IMPROVED
SURFACE WIDTH	22	24	24	24	24	24	24	24	24	24	24	SURFACE WIDTH
ROADWAY WIDTH	24	24	26	26	24	26	26	26	24	28	28	ROADWAY WIDTH
FOUNDATION - 10	0	9	0	0	0	0	0	2	5	8	6	FOUNDATION - 10
SURFACE - 30	14	13	13	14	9	16	16	16	19	22	20	SURFACE - 30
DRAINAGE - 10	8	8	8	10	9	10	9	8	9	10	10	DRAINAGE - 10
SAFETY - 20	2	1	1	5	6	1	4	1	2	1	10	SAFETY - 20
ADT 1969	1190	673	767	756	790	850	950	720	635	677	591	ADT 1969
DESIGN HOUR VOLUME	150	90	100	100	110	110	130	100	90	90	80	DESIGN HOUR VOLUME
HOURLY SERVICE VOLUME	201	196	211	387	393	255	255	124	258	479	331	HOURLY SERVICE VOLUME
CAPACITY RATING - 30	18	23	22	26	25	23	22	17	24	27	26	CAPACITY RATING - 30
SUFFICIENCY RATING	42	45	44	55	49	50	51	44	59	68	72	SUFFICIENCY RATING
ADJUSTED RATING	39	46	44	55	49	49	49	44	60	69	74	ADJUSTED RATING



BEGINNING MILE POST	311.6					312.9
LENGTH	1.3					1.0
YEAR BUILT	NON-EXISTENT					NON-EXISTENT
YEAR IMPROVED						
SURFACE WIDTH						
ROADWAY WIDTH						
FOUNDATION - 10						
SURFACE - 30						
DRAINAGE - 10						
SAFETY - 20						
ADT 1969						
DESIGN HOUR VOLUME						
HOURLY SERVICE VOLUME						
CAPACITY RATING - 30						
SUFFICIENCY RATING						
ADJUSTED RATING						

BEGINNING MILE POST	55.0	55.3	
LENGTH	0.3	0.9	
YEAR BUILT		31	
YEAR IMPROVED	UNDER CONSTRUCTION	34	
SURFACE WIDTH		22	
ROADWAY WIDTH		24	
FOUNDATION - 10		0	URBAN
SURFACE - 30		10	
DRAINAGE - 10		4	
SAFETY - 20		20	
ADT 1969		2258	
DESIGN HOUR VOLUME		270	
HOURLY SERVICE VOLUME		761	
CAPACITY RATING - 30		24	
SUFFICIENCY RATING		58	
ADJUSTED RATING		50	

LOCAL TRAVEL INFORMATION

In addition to state travel, tourist travel, traffic counts, and highway conditions; a survey of the Crow Reservation was made to determine local traffic patterns of the residents. The survey asked the residents to describe their travel and shopping patterns. The results of this survey indicated that the favored shopping areas of all the residents on the Reservation were as follows:

1. Hardin
2. Billings
3. Sheridan, Wyoming
4. Crow Agency

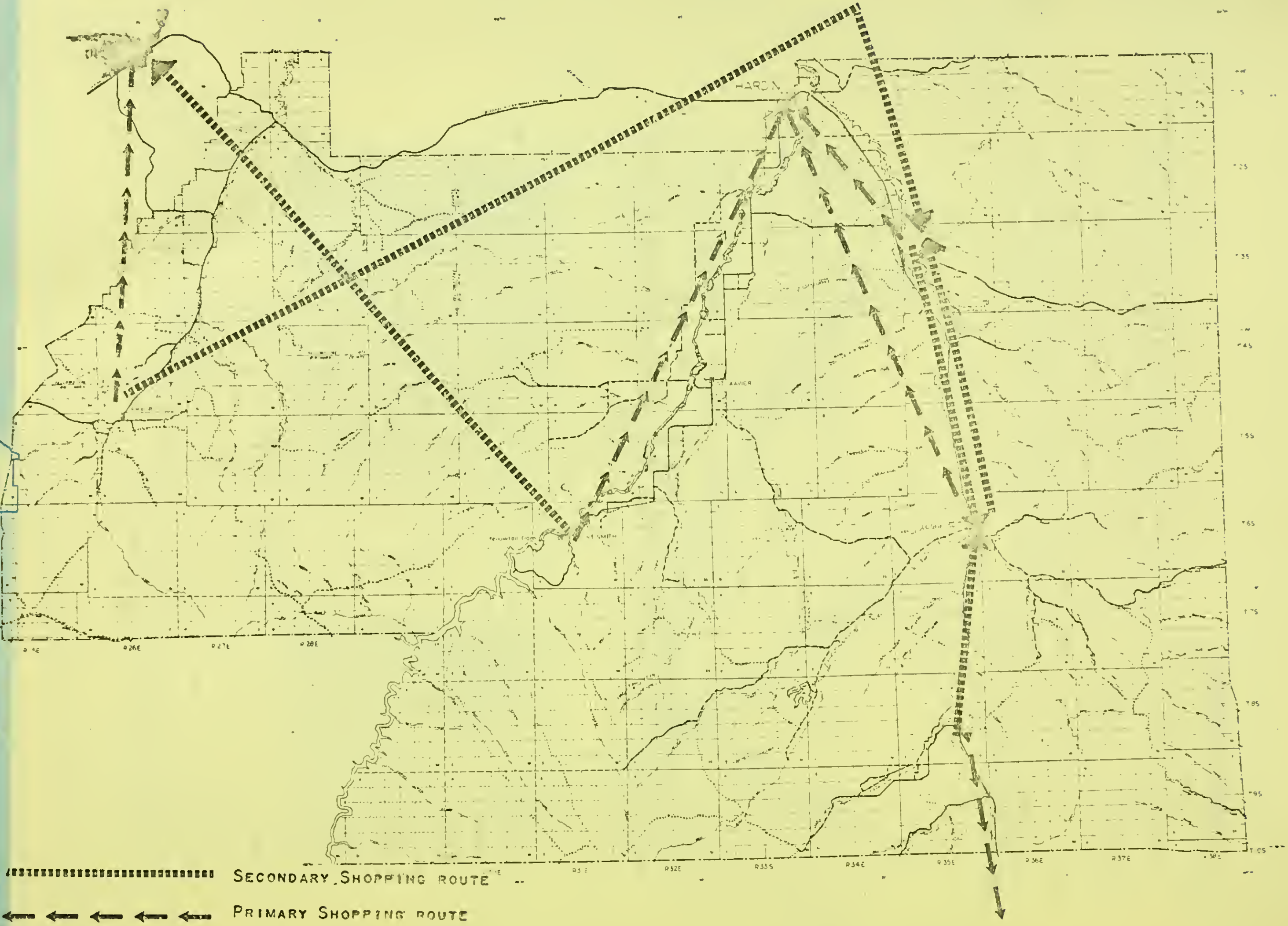
The survey further pointed out that although Billings is much larger and offers a greater number of stores, that in no category did Billings out sell Hardin. Also, a large number of those surveyed indicated that they made a daily trip to Hardin.

It also indicated that there were no major shopping or travel pattern differences between the Indian and Non-Indians interviewed. Likewise, the results of the survey showed that there was no difference in travel patterns whether a large purchase or a small purchase was anticipated.

The chart of the Crow Reservation on the following page shows the primary and secondary shopping patterns of the residents. As can be seen only the residents on the fringe areas of the Reservation (Wyola and Pryor) do their primary shopping in areas other than Hardin.

Then the tables which are given indicate the travel patterns of the residents from each of the economic districts of the Reservation, and the distances that they usually travel for various reasons.

It was felt that it would be interesting to determine if the residents would favor a public transportation system in the area. As can be seen on the last table of this section, the majority of the residents would not use or be in favor of a public transportation system. However, it should be noted that the Indian residents were more apt to favor such a system than the Non-Indian residents.



PRIMARY AND SECONDARY SHOPPING ROUTES OF RESERVATION RESIDENTS

TABLE 2

TRIP INTERCHANGE TABLE

Crow Reservation
1971

PURPOSE OF TRIP	ALL INDICATED DESTINATIONS FROM CROW RESERVATION (TOTAL)											
	Billings	Bridger	Crow Agency	Edgar	Hardin	Lodge Grass'	Lovell	Pryor	Sheridan	St. Xavier	Wyola	Other
Groceries	134	5	28	3	296	137	0	13	45	21	5	7
Clothing	227	0	7	1	311	31	0	1	94	10	0	0
Gasoline	76	22	30	1	287	126	0	16	13	9	27	9
Automobiles	189	5	8	1	315	2	0	0	51	1	1	2
Furniture	208	1	1	1	286	1	0	0	77	0	0	0
Major Appliances	191	0	2	1	280	20	0	0	79	0	0	0
Drug Items	110	0	44	1	325	26	0	6	84	0	0	0
Household needs	100	0	16	1	296	101	0	8	56	8	1	0
Farm Supplies	99	2	0	1	204	8	0	1	40	2	2	0
Farm Machinery	131	1	0	1	167	1	0	1	38	0	0	0
Most Shopping Trips are to	132	0	9	2	303	83	0	2	66	0	1	1
Most Business Trips are to	147	1	38	4	368	25	0	0	18	3	1	0
Most Personal Trips are to	138	6	26	2	247	50	0	0	54	6	10	1
Most Social Trips are to	105	7	44	2	243	42	0	4	58	12	9	4
Most Medical Trips are to	156	7	51	3	286	0	0	0	81	6	1	2
Most Dental Trips are to	120	2	42	4	295	1	0	1	81	1	1	0
Most Church Trips are to	66	2	52	1	168	88	1	19	33	41	4	7
Daily Trips Made to	44	11	82	2	123	52	0	15	7	37	17	13
Weekly Trips Made to	108	13	18	2	272	82	3	4	40	18	6	4
Monthly Trips Made to	233	7	13	1	185	29	1	5	75	5	3	3
An Annual Trip Made to	177	5	10	2	109	14	2	3	47	4	2	5

SOURCE: Harrison G. Fagg and Associates Survey, 1971

TABLE 3

TRIP INTERCHANGE TABLE

CROW RESERVATION
1971

PURPOSE OF TRIP	INDICATED DESTINATIONS FROM AGENCY DISTRICT											
To Buy	Billings	Bridger	Crow Agency	Edgar	Hardin	Lodge Grass	Lovell	Pryor	Sheridan	St. Xavier	Wyola	Other
Groceries	23	0	17	0	160	163	0	0	19	0	0	0
Clothing	59	0	0	0	222	40	0	0	81	0	0	0
Gasoline	4	1	8	0	139	153	0	0	3	0	1	0
Automobiles	46	0	2	0	222	2	0	0	45	0	0	2
Furniture	65	0	0	0	193	2	0	0	70	0	0	0
Major Appliances	49	0	1	0	195	20	0	0	65	0	0	0
Drug Items	23	0	61	0	182	22	0	0	45	0	0	0
Household Needs	10	0	5	0	164	126	0	0	27	0	0	0
Farm Supplies	22	0	1	0	117	10	0	0	32	0	0	1
Farm Machinery	19	0	0	0	90	0	0	0	10	0	0	1
Most Shopping Trips Are To	40	0	4	1	158	116	0	1	28	0	1	0
Most Business Trips Are To	27	1	61	1	217	19	0	0	7	0	0	0
Most Personal Trips Are To	31	3	18	2	151	71	0	0	25	0	4	1
Most Social Trips Are To	33	1	18	2	152	67	0	0	31	0	3	0
Most Medical Trips Are To	40	3	81	2	168	0	0	0	48	0	0	0
Most Dental Trips Are To	34	0	65	2	162	2	0	0	44	0	0	0
Most Church Trips Are To	1	1	16	1	133	119	1	0	5	0	1	0
Daily Trips Are Made To	0	0	23	1	134	67	0	0	0	0	2	0
Weekly Trips Are Made To	16	3	41	0	163	87	3	2	29	0	1	0
Monthly Trips Are Made To	86	2	37	0	178	31	1	3	65	0	1	0
An Annual Trip Is Made To	139	2	7	0	110	9	2	2	25	0	0	2

SOURCE: Harrison G. Fagg and Associates Survey, 1971

TABLE 4

TRIP INTERCHANGE TABLE

CROW RESERVATION
1971

PURPOSE OF TRIP	INDICATED DESTINATIONS FROM WYOLA DISTRICT											
To Buy	Billings	Bridger	Crow Agency	Edgar	Hardin	Lodge Grass	Lovell	Pryor	Sheridan	St. Xavier	Wyola	Other
Groceries	0	5	1	0	10	58	0	0	40	0	7	1
Clothing	15	2	0	0	25	9	0	0	75	0	1	0
Gasoline	0	46	0	0	5	29	1	0	13	0	54	2
Automobiles	19	9	2	0	41	1	0	0	41	0	1	0
Furniture	22	1	0	0	19	0	0	0	65	0	0	0
Major Appliances	18	0	0	0	18	4	0	0	68	0	0	0
Drug Items	3	1	21	0	21	1	0	1	61	0	0	0
Household Needs	3	0	0	0	13	44	0	0	50	0	1	0
Farm Supplies	7	2	0	0	10	4	0	0	19	0	2	0
Farm Machinery	10	1	0	0	8	0	0	0	14	0	0	0
Most Shopping Trips Are To	6	0	0	0	14	30	0	0	55	0	0	0
Most Business Trips Are To	8	0	42	0	36	4	0	0	20	0	1	0
Most Personal Trips Are To	10	5	9	0	7	28	1	0	36	0	8	0
Most Social Trips Are To	7	6	7	0	11	24	1	0	40	2	10	0
Most Medical Trips Are To	6	8	45	0	7	0	0	0	41	0	1	0
Most Dental Trips Are To	6	1	43	0	9	0	0	0	46	0	1	0
Most Church Trips Are To	1	8	0	0	5	25	0	0	20	1	25	0
Daily Trips Are Made To	0	24	5	0	4	15	0	0	3	2	28	1
Weekly Trips Are Made To	2	25	10	0	12	25	0	0	30	0	10	0
Monthly Trips Are Made To	19	11	14	0	15	17	0	0	50	0	4	0
An Annual Trip Is Made To	41	3	7	0	15	8	1	0	41	0	1	0

SOURCE: Harrison G. Fagg and Associates Survey, 1971

TABLE 5

TRIP INTERCHANGE TABLE

Crow Reservation
1971

PURPOSE OF TRIP	INDICATED DESTINATIONS FROM LODGE GRASS DISTRICT											
To Buy	Billings	Bridger	Crow Agency	Edgar	Hardin	Lodge Grass	Lovell	Pryor	Sheridan	St. Xavier	Wyola	Other
Groceries	39	0	98	0	180	11	0	0	1	0	0	0
Clothing	89	1	5	1	207	3	0	0	5	0	0	0
Gasoline	10	0	128	1	160	10	0	0	1	0	0	0
Automobiles	85	0	3	1	193	0	0	0	3	0	0	1
Furniture	112	0	2	0	170	2	0	0	6	0	0	1
Major Appliances	97	0	2	0	178	6	0	0	3	0	0	1
Drug Items	20	1	124	1	142	6	0	0	3	0	0	0
Household Needs	22	1	67	1	190	9	0	1	3	0	0	0
Farm Supplies	6	0	3	0	56	2	0	0	1	0	0	1
Farm Machinery	9	0	1	0	43	2	0	0	3	0	0	1
Most Shopping Trips Are To	52	0	48	1	190	7	0	0	5	0	0	0
Most Business Trips Are To	62	0	66	1	163	5	0	0	5	1	0	0
Most Personal Trips Are To	45	1	91	1	138	11	0	0	5	1	1	0
Most Social Trips Are To	32	3	117	0	116	10	0	1	2	1	1	2
Most Medical Trips Are To	24	3	168	1	89	0	0	0	3	0	0	0
Most Dental Trips Are To	19	2	167	2	89	0	0	0	4	0	0	0
Most Church Trips Are To	6	1	174	0	60	6	0	0	0	2	0	2
Daily Trips Are Made To	1	1	175	0	69	9	0	0	0	0	0	2
Weekly Trips Are Made To	31	1	13	4	221	10	0	0	1	1	1	0
Monthly Trips Are Made To	179	2	2	1	68	0	0	0	2	1	1	1
An Annual Trip Is Made To	79	1	7	1	29	0	0	2	6	2	1	5

SOURCE: Harrison G. Fagg and Associates Survey, 1971

TABLE 6

TRIP INTERCHANGE TABLE

Crow Reservation
1971

PURPOSE OF TRIP	INDICATED DESTINATIONS FROM BIG HORN DISTRICT											
To Buy	Billings	Bridger	Crow Agency	Edgar	Hardin	Lodge Grass	Lovell	Pryor	Sheridan	St. Xavier	Wyola	Other
Groceries	33	1	4	0	121	6	0	0	1	36	1	8
Clothing	74	0	5	0	111	3	0	0	2	15	0	0
Gasoline	13	2	8	0	128	5	0	0	2	18	1	10
Automobile	65	1	6	0	103	0	0	0	2	4	0	0
Furniture	47	0	0	0	114	0	0	0	2	0	0	0
Major Applianced	50	0	1	0	112	0	0	0	2	0	0	0
Drug Items	13	1	20	0	125	0	0	0	1	0	0	0
Household Needs	20	0	2	0	121	3	0	0	1	15	0	2
Farm Supplies	25	0	2	0	77	1	0	0	2	5	0	0
Farm Machinery	48	0	0	0	56	0	0	1	17	0	0	0
Most Shopping Trips Are To	16	0	0	0	125	2	0	0	7	2	0	1
Most Business Trips Are To	41	2	12	2	112	0	0	0	0	10	0	0
Most Personal Trips Are To	27	1	11	0	103	5	0	0	1	8	1	0
Most Social Trips Are To	15	3	13	0	96	4	0	0	1	15	1	3
Most Medical Trips Are To	42	2	20	1	92	2	0	0	1	10	1	1
Most Dental Trips Are To	20	2	23	0	106	1	0	0	1	2	0	0
Most Church Trips Are To	33	2	17	0	41	5	0	0	8	47	1	6
Daily Trips Are Made To	40	3	13	0	20	1	0	0	5	52	3	11
Weekly Trips Are Made To	50	1	10	0	66	6	0	1	1	31	1	6
Monthly Trips Are Made To	58	1	10	0	53	1	0	2	1	6	0	2
An Annual Trip Is Made To	48	0	8	1	25	2	0	1	3	4	0	1

SOURCE: Harrison G. Fagg and Associates Survey, 1971

TABLE 7

TRIP INTERCHANGE TABLE

CROW RESERVATION
1971

PURPOSE OF TRIP	INDICATED DESTINATIONS FROM PRYOR DISTRICT											
To Buy	Billings	Bridger	Crow Agency	Edgar	Hardin	Lodge Grass	Lovell	Pryor	Sheridan	St. Xavier	Wyola	Other
Groceries	124	0	2	3	7	0	0	54	0	0	0	0
Clothing	132	0	0	1	4	0	0	6	0	0	0	0
Gasoline	110	0	1	2	3	0	0	52	0	0	0	0
Automobile	115	0	0	1	7	0	0	2	0	0	0	0
Furniture	118	0	0	1	0	0	0	1	0	0	0	0
Major Appliances	121	0	0	1	1	0	0	1	0	0	0	0
Drug Items	120	0	5	1	1	0	0	16	0	0	0	0
Household Needs	122	0	0	1	0	0	0	48	0	0	0	0
Farm Supplies	86	0	0	1	1	0	0	1	0	0	0	0
Farm Machinery	81	0	0	1	3	0	0	1	0	0	0	0
Most Shopping Trips Are To	123	0	0	1	3	0	0	9	0	0	0	0
Most Business Trips Are To	93	0	46	3	17	1	0	2	0	0	0	0
Most Personal Trips Are To	85	1	8	1	3	0	0	8	0	0	0	0
Most Social Trips Are To	72	2	15	2	5	4	0	13	0	1	0	1
Most Medical Trips Are To	103	0	17	1	0	0	0	13	0	0	0	1
Most Dental Trips Are To	99	1	23	1	0	0	0	1	0	0	0	0
Most Church Trips Are To	38	2	0	1	0	0	0	63	1	0	0	0
Daily Trips Are Made To	31	0	3	4	1	0	0	46	0	0	0	1
Weekly Trips Are Made To	78	0	6	1	2	1	0	10	1	0	0	0
Monthly Trips Are Made To	53	1	25	3	9	4	0	3	0	1	0	1
An Annual Trip Is Made To	34	4	17	3	16	3	1	3	2	2	2	2

SOURCE: Harrison G. Fagg and Associates Survey, 1971

TABLE 8

TRIP INTERCHANGE TABLE

CROW RESERVATION
1971

PURPOSE OF TRIP	ALL INDICATED NON-INDIAN DESTINATIONS FROM CROW RESERVATION (TOTAL)											
To Buy	Billings	Bridger	Crow Agency	Edgar	Hardin	Lodge Grass	Lovell	Pryor	Sheridan	St. Xavier	Wyola	Other
Groceries	219	6	123	3	480	239	0	54	61	36	8	9
Clothing	370	3	10	2	572	55	0	6	164	15	1	0
Gasoline	138	49	145	3	437	198	1	52	19	18	56	12
Automobiles	331	10	13	2	568	3	0	2	91	4	1	3
Furniture	365	1	2	1	493	4	0	1	144	0	0	1
Major Appliances	335	0	4	1	507	30	0	1	139	0	0	1
Drug Items	179	3	232	2	472	29	0	17	110	0	0	0
Household Needs	177	1	74	2	490	183	0	19	81	15	1	2
Farm Supplies	146	2	6	1	262	17	0	1	54	5	2	2
Farm Machinery	167	1	1	1	201	2	0	2	44	0	0	2
Most Shopping Trips Are To	238	0	52	3	492	156	0	10	95	2	1	1
Most Business Trips Are To	231	3	229	7	547	29	0	2	32	11	1	0
Most Personal Trips Are To	198	11	137	4	404	115	1	8	68	9	14	1
Most Social Trips Are To	160	15	171	4	382	110	1	14	74	19	15	6
Most Medical Trips Are To	216	16	333	5	357	2	0	13	93	10	2	2
Most Dental Trips Are To	179	6	323	5	367	3	0	1	95	2	1	0
Most Church Trips Are To	79	14	208	2	240	156	1	63	34	50	27	8
Daily Trips Are Made To	72	28	220	5	230	93	0	46	18	54	33	15
Weekly Trips Are Made To	178	30	81	5	465	129	3	13	62	32	13	6
Monthly Trips Are Made To	395	17	88	4	325	53	1	8	120	8	6	4
An Annual Trip Is Made To	343	10	46	5	196	22	4	8	77	9	4	10

SOURCE: Harrison G. Fagg and Associates Survey, 1971

TABLE 9

TRIP INTERCHANGE TABLE

CROW RESERVATION
1971

PURPOSE OF TRIP	ALL INDICATED INDIAN DESTINATIONS FROM CROW RESERVATION (TOTAL)											
TO BUY	BILLINGS	BRIDGER	CROW AGENCY	EDGAR	HARDIN	LODGE GRASS	LOVELL	PRYOR	SHERIDAN	ST. XAVIER	WYOLA	OTHER
GROCERIES	85	1	95	0	184	102	0	36	15	15	2	2
CLOTHING	143	2	3	1	261	24	0	5	69	5	1	0
GASOLINE	62	27	115	2	150	72	1	36	6	9	29	2
AUTOMOBILES	142	5	4	1	242	1	0	2	40	3	0	1
FURNITURE	156	0	1	0	210	3	0	1	67	0	0	1
MAJOR APPLIANCES	144	0	2	0	227	9	0	1	60	0	0	1
DRUG ITEMS	69	3	188	1	147	3	0	10	26	0	0	0
HOUSEHOLD NEEDS	77	1	58	1	194	81	0	11	24	7	0	2
FARM SUPPLIES	47	0	6	0	58	9	0	0	14	3	0	2
FARM MACHINERY	36	0	1	0	34	1	0	1	6	0	0	2
MOST SHOPPING TRIPS ARE TO	106	0	43	1	189	73	0	8	28	2	0	0
MOST BUSINESS TRIPS ARE TO	83	2	191	3	179	4	0	2	14	3	0	0
MOST PERSONAL TRIPS ARE TO	60	5	111	2	157	65	1	8	13	3	4	0
MOST SOCIAL TRIPS ARE TO	55	8	127	2	138	68	1	10	16	7	6	2
MOST MEDICAL TRIPS ARE TO	60	9	282	2	71	2	0	13	11	4	1	0
MOST DENTAL TRIPS ARE TO	59	4	281	1	72	2	0	0	13	1	0	0
MOST CHURCH TRIPS ARE TO	13	12	156	1	72	67	0	44	1	9	23	1
DAILY TRIPS ARE MADE TO	28	17	138	3	107	41	0	31	1	17	16	1
WEEKLY TRIPS ARE MADE TO	70	17	62	3	193	47	0	9	22	14	7	2
MONTHLY TRIPS ARE MADE TO	162	9	75	3	140	24	0	3	45	3	2	1
AN ANNUAL TRIP IS MADE TO	166	5	36	3	87	8	2	5	29	5	2	5

SOURCE: HARRISON G. FAGG AND ASSOCIATES SURVEY, 1971

TABLE 10

DISTANCE RELATIONSHIPS BETWEEN HOME AND SELECTED DESTINATIONS

CROW RESERVATION
1971

(PROPORTIONAL DISTRIBUTION OF ALL DISTANCES FROM HOME TO DESTINATION)

DESTINATIONS	ALL HOUSEHOLDS									INDIAN HOUSEHOLDS									NON-INDIAN HOUSEHOLDS								
	¼ MILE	½ MILE	1 MILE	2 MILES	5 MILES	10 MILES	20 MILES	30 MILES	50 MILES	¼ MILE	½ MILE	1 MILE	2 MILES	5 MILES	10 MILES	20 MILES	30 MILES	50 MILES	¼ MILE	½ MILE	1 MILE	2 MILES	5 MILES	10 MILES	20 MILES	30 MILES	50 MILES
PAVED STREET	49%	9%	8%	6%	9%	10%	5%	2%	1%	38%	15%	9%	7%	12%	11%	5%	2%	1%	55%	6%	7%	6%	7%	10%	6%	2%	1%
HIGHWAY	41	21	15	9	6	5	3	1	-	28	30	20	5	7	6	2	2	-	47	17	13	10	5	5	3	1	-
ELEMENTARY SCHOOL	26	11	9	7	14	16	12	4	-	10	17	18	10	17	17	8	2	0	33	9	5	6	13	15	14	5	-
HIGH SCHOOL	17	1	1	3	5	17	38	12	6	2	-	2	3	7	21	52	10	3	24	2	1	3	5	15	31	15	8
GROCERY STORE	27	9	9	8	11	19	14	3	1	14	13	15	10	12	24	10	2	1	33	7	7	7	10	17	16	4	1
CLOTHING STORE	17	1	1	3	4	15	33	16	11	2	1	1	3	6	21	46	13	8	24	2	1	3	3	12	26	17	12
AUTO SALES & SERVICE	-	-	1	1	2	8	25	35	28	1	-	-	1	2	10	37	19	30	-	-	1	2	2	7	19	42	27
MEDICAL FACILITY	3	8	5	3	4	8	18	30	22	4	16	11	3	6	12	10	23	15	3	4	2	2	3	7	22	33	25
CHURCH	28	10	7	7	10	17	12	5	4	18	13	14	11	13	20	7	3	1	33	8	3	6	9	16	15	6	5

SOURCE: HARRISON G. FAGG AND ASSOCIATES SURVEY

TABLE 11

PUBLIC TRANSPORTATION OPINIONS

Crow Reservation

	ALL RESPONDANTS		INDIAN RESPONDANTS		NON-INDIAN RESPONDANTS	
	Yes	No	Yes	No	Yes	No
IF PUBLIC TRANSPORTATION WAS AVAILABLE WOULD YOU USE IT?	37.8%	62.2%	51.1%	48.9%	27.5%	72.5%
WOULD YOU BE IN FAVOR OF USING THE SCHOOL BUSSES FOR PUBLIC TRANSPORTATION WHEN NOT IN USE FOR SCHOOL CHILDREN?	21.1%	78.6%	27.2%	72.8%	16.3%	83.7%

SOURCE: Harrison G. Fagg and Associates Surveys, 1971

TRANSPORTATION NEEDS:

The existing roads and highways on the Crow Reservation are generally adequate for the present amount of traffic and the population of the area. However, there are many areas which need to be connected by roads for the convenience of the residents. At the present, it is often necessary to drive many miles to an area which is really close in terms of air miles.

Some of the pressing needs in terms of road construction are as follows:

St.Xavier-Pryor Road:

This highway would provide a route from the town of St. Xavier on the Big Horn River to connect with the town of Pryor on Pryor Creek on

THE WESTERN EDGE OF THE RESERVATION; AND WOULD OPEN UP A VAST, UNDEVELOPED AREA TO THE PROSPECTIVE USE OF MANY PEOPLE. THIS AREA IS PRESENTLY SERVICED BY JEEP TRAILS WHICH FOLLOW CATTLE TRAILS AND IS IMPOSSIBLE TO GET THROUGH IN ANY BUT A FEW MONTHS OF THE SUMMER. THIS HIGHWAY IS NEEDED TO GET THE PEOPLE TO THE NEW LAND WHICH IS TO BE IRRIGATED BY WATER FROM BIG HORN LAKE.

IN ADDITION TO ALLOWING ACCESS TO THIS NEW IRRIGATION PROJECT, THIS ROAD WOULD ALLOW ACCESS TO MOST TRACTS OF CROW INDIAN LAND WHICH IS PRESENTLY LEASED FOR MUCH LESS THAN FAIR MARKET VALUE BECAUSE OF THE FACT THAT COMPETITORS FOR THE LAND CANNOT GET TO IT ECONOMICALLY.

ALSO, THIS ROAD WOULD ALLOW THE PEOPLE AT PRYOR TO DRIVE TO THE BIG HORN VALLEY AND TO THE BIG HORN CANYON NATIONAL RECREATION AREA WHERE THEY COULD FIND EMPLOYMENT WHICH IS NOT AVAILABLE IN THE PRYOR AREA.

FROM THE CROW TRIBE'S POINT OF VIEW AS PRESENTED BY EDISON REAL BIRD, TRIBAL CHAIRMAN, IN A U. S. SENATE HEARING THE JUSTIFICATIONS FOR THIS ROAD ARE AS FOLLOWS:

1. THIS ROAD WOULD PASS THROUGH THE CENTER OF THE CROW RESERVATION AND OPEN UP THOUSANDS OF ACRES OF LAND WHICH TODAY ARE PRACTICALLY ISOLATED.
2. MANY OF THE CROW PEOPLE OWNING LAND IN THIS AREA ARE INTERESTED IN LIVING ON THEIR LAND BUT HERETOFORE HAVE BEEN UNABLE TO GET TO IT BECAUSE OF THE UNPASSABLE ROADS. THEREFORE, IT WOULD RESULT IN CROW PEOPLE MOVING FROM A CLUSTER SITUATION TO THEIR LANDS AND CREATE A SITUATION WHERE THE LANDOWNERS WOULD USE THEIR OWN LAND RATHER THAN LEASE TO NON-INDIAN LAND BARONS.
3. THERE IS PRESENTLY ONLY ONE AGRICULTURAL CONCERN USING MOST OF THE LAND WHICH WOULD BE OPENED UP BY THE CONSTRUCTION OF THIS ROAD. THIS HAS CREATED A VERY UNFAVORABLE "NO COMPETITION" SITUATION. THE OWNERS OF LANDS IN THIS AREA DO NOT HAVE THE ALTERNATIVE TO LEASE THEIR LAND TO ANYONE OTHER THAN THE CAMPBELL FARMING CORPORATION WHICH CONTRACTS MOST OF THE AREA. THIS NO COMPETITION SITUATION HAS RESULTED IN THE OWNERS NOT RECEIVING A RENTAL WHICH IS COMMENSURATE WITH THAT RECEIVED IN OTHER AREAS OF THE RESERVATION. THIS ROAD WOULD

open the heartland of the Crow Reservation not only for Indian operators but other non-Indian operators to compete with colonizing Campbell Farming Corporation. This competition would create a healthy business situation and give more individuals the opportunity to use the land, and would raise the lease rentals as well as the price of lands which were subject to sale in the area.

4. The people living in the communities on the Crow Reservation will benefit also. It would shorten the distance between Pryor, St. Xavier, and Crow Agency. People working in and traveling to Crow Agency will be greatly aided by this road.
5. The road will also serve the Big Horn Canyon National Recreation area. It would shorten the distance between Billings, the largest metropolitan area and the recreation area.
6. This road will provide access to approximately 10,000 acres lying below the Big Horn Dam which has been designated for future irrigational development. This would be a significant development in the economy of eastern Montana. It is absolutely necessary that the area be served with a good highway.

Big Horn Canyon Road:

The first segment of the road from Lovell, Wyoming to Fort Smith, Montana has been completed. This is the portion from Lovell to Barry's Landing on Big Horn Lake. It is imperative that this road be completed for the development of the recreational potential of the Big Horn Lake area. Due to intense efforts made by the Crow Tribe and the Big Horn Development Association, the construction of the road has been given high priority by the National Park Service.

Wyola-Fort Smith-Billings Road:

To encourage the tourist utilization of Big Horn Lake a road from Wyola to Fort Smith is needed. At the present time, the tourist entering from Wyoming must drive to Hardin and then double back to Fort Smith. After this portion of the road is completed, it should be extended from Fort Smith to Billings. It would be recommended that this road be constructed as Interstate 90 South connecting to the existing Billings-Pryor road. The Billings Chamber of Commerce is actively promoting the road from Billings to Fort Smith.

Big Horn Canyon Loop Road:

After the completion of the Wyola-Billings road and the Big Horn Canyon road, a loop road around the east side of the Big Horn Canyon should be constructed to offer the tourist a complete tour of the area.

Road to Coal Areas:

A road from Crow Agency to the proposed new coal development site should be built to encourage the total development of the coal potential on the Reservation. The Tribe would benefit from lease payments and the increased opportunity for employment.

TABLE 12

FORECASTS OF VEHICLE REGISTRATION

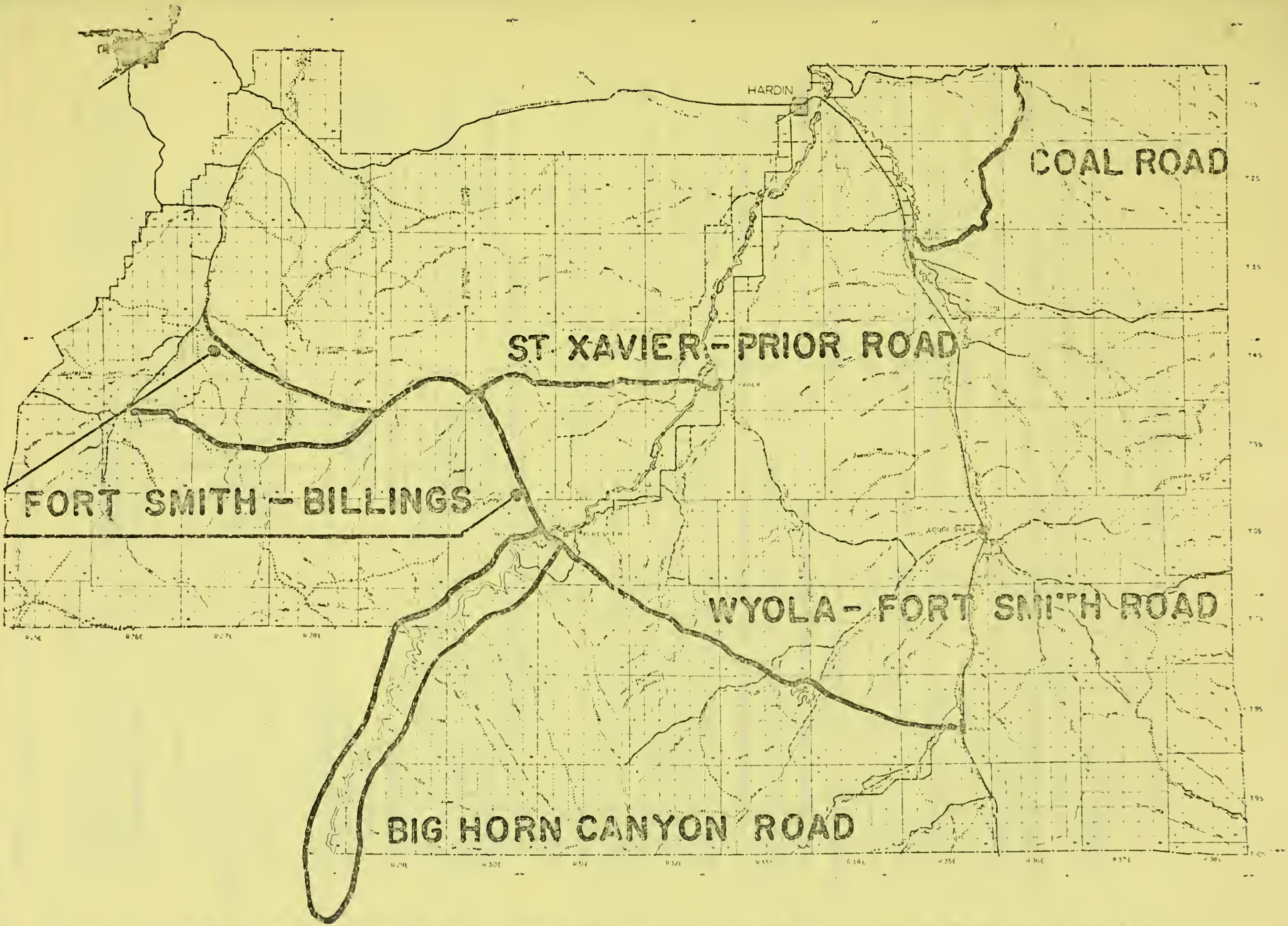
Crow Reservation, Montana
1970-1995

YEAR	AUTOMOBILES	TRUCKS	TOTAL VEHICLES
1970	2696	1598	4294
1975	3293	1950	5243
1980	3919	2552	6471
1985	4236	2758	6994
1990	5001	3251	8254
1995	5965	3858	9823
1970-1995 Increase Number	3269	2260	5529
PERCENT	121.3%	141.4%	128.7%

SOURCE: Harrison G. Fagg and Associates estimate

Road Design Standards:

Type of Thoroughfare	Right-of-way Width	No. Traffic Lanes	Median Strip Width	Traffic Volume
Major & Secondary	90' - 120'	4-6	20'-60'	Varies with function
Collector Streets	80' - 100'	4	0'-20'	1,000-25,000
Minor Streets	60' - 80'	2	0'	600-1,500



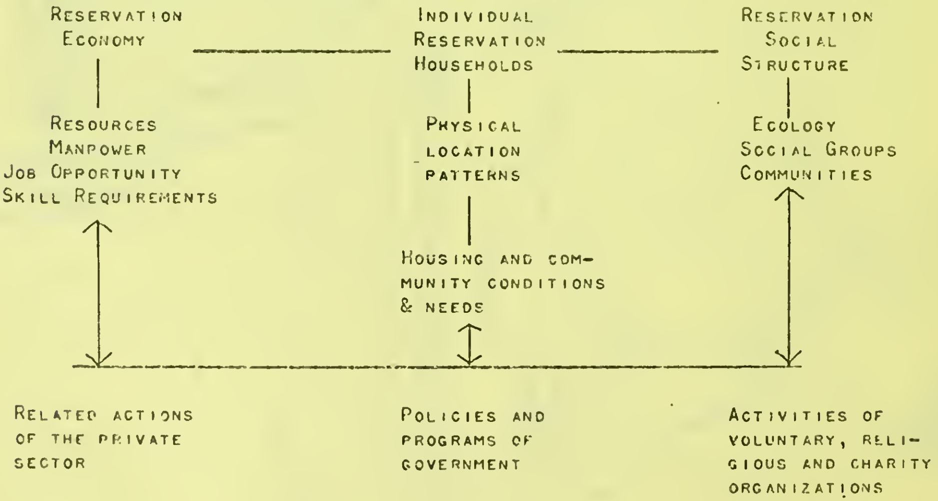
ROAD CONSTRUCTION NEEDS - CROW RESERVATION

SOCIAL PLAN

INTRODUCTION

THROUGH A NUMBER OF PROGRAMS ENACTED OVER THE YEARS, THERE HAVE BEEN EFFORTS UNDERTAKEN ON THE CROW RESERVATION TO ASSIST GROUPS WITH DIFFICULT SOCIAL PROBLEMS. FEDERAL PROGRAMS HAVE DIRECTED ACTION TOWARD OVERCOMING POVERTY, POOR HOUSING, RACIAL DISCRIMINATION, EDUCATIONAL DEPRIVATION AND MANY OTHER DETRIMENTAL CONDITIONS FACING RESIDENTS ON THE CROW RESERVATION. AVAILABILITY OF THOSE PROGRAMS COMBINED WITH EDUCATIONAL ADVANCES OF THE RESIDENT POPULATION BRINGS INTO FOCUS THE FACT THAT MANY OF THE RESERVATION'S HARD-CORE SOCIAL PROBLEMS ARE ESSENTIALLY INTERRELATED AND THAT HUMAN RESOURCES AND ISSUES RELATING THERETO SHOULD BE TREATED IN A COORDINATE MANNER. FOR INSTANCE, OVERCOMING POVERTY REQUIRES EQUIPPING PEOPLE WITH THE TOOLS OF ADEQUATE EDUCATION AND JOB OPPORTUNITIES APPROPRIATE TO THEIR ABILITIES. IF THE LOCAL CAPABILITY TO FULLY TAP CURRENT POTENTIALITIES FOR A MORE EFFECTIVE ATTACK ON MAJOR RESERVATION PROBLEMS IS TO BE ACHIEVED, IT IS ESSENTIAL THAT PHYSICAL PLANNING AND HUMAN RESOURCE DEVELOPMENT PROGRAMS BE SUBJECTED TO ON-GOING HIGH LEVEL COORDINATION. THE FOLLOWING TABLE GENERALIZES THE CONCERNS OF THE CROW RESERVATION SOCIAL PLAN.

CONCERNS OF THE CROW RESERVATION SOCIAL PLAN


RESERVATION ECONOMY
INDIVIDUAL RESERVATION HOUSEHOLDS
RESERVATION SOCIAL STRUCTURE
RESOURCES
MANPOWER
JOB OPPORTUNITY
SKILL REQUIREMENTS
PHYSICAL LOCATION PATTERNS
ECOLOGY
SOCIAL GROUPS
COMMUNITIES
HOUSING AND COMMUNITY CONDITIONS & NEEDS
RELATED ACTIONS OF THE PRIVATE SECTOR
POLICIES AND PROGRAMS OF GOVERNMENT
ACTIVITIES OF VOLUNTARY, RELIGIOUS AND CHARITY ORGANIZATIONS

SOURCE: HARRISON G. FAGG & ASSOCIATES

Actual integration of physical and social planning and development activities can only be accomplished when adequate appreciation of each function's existence and potential role is present among all significant entities participating in the process of reservation development. Such awareness and recognition can provide an intellectual and action base for effective collaboration between physical and social planning in the solution of critical reservation problems.

As has been related throughout the sections of this report, physical planning steps are largely geared to achievement of goals which are similar to those of locally active social action programs. If the present social plan is to make any contribution in this regard, it should come from focussing attention upon the need for joint and cooperative efforts by the diversity of participants in research, planning, and action on the reservation. Particularly important will be the use of E.D.A. programs for creating needed jobs through industrial resources and recreational development and use of a community renewal program to develop a strategy for improving living conditions for the reservation residents.

SOCIAL GOALS FOR THE CROW RESERVATION

In light of the recognized need for coordination between the reservation's physical and social programs, a basic set of three (3) reservation goals that are common and meaningful to both are set forth. If siginficant progress is to be made on the reservation, action should be directed in these three (3) areas by both the long-range physical planning programs and the short-range social-type action programs. The goals and some of their subordinate objectives are as follows:

1. A decent home and suitable environment for every reservation resident within ten (10) years.
    - (a) Provision of adequate housing for each reservation resident to meet individual and family physical and psychological needs;
    - (b) Production of housing to meet anticipated population growth should be accelerated;
    - (c) Mechanisms should be established and utilized to develop, rehabilitate, and improve housing at cost levels which are consistent with the income levels present within the area;

(D) A complete program of up-to-date and adequate codes and ordinances and an implementation program therefor should be developed by the Crow Reservation to guide future housing development and to help eliminate substandard housing.

2. An increase in per capita income to levels favorably comparative to those of contemporary Montana and the United States within twenty-five (25) years.

(A) Realization of the potential of the reservation's physical and human resources should result in development of employment in high value, labor, intensive manufacturing, mineral resource extraction and processing, and commercial recreation service enterprises. In addition, consolidation and improvement of agricultural activity would be desired;

(B) Based upon income derived from basic employment growth, the reservation should experience increases in local service jobs to provide for increasingly higher levels of demand by the resident population base;

(C) Through significant improvement of potentials for personal income production on the reservation, increasing numbers of young residents should remain here, thus providing the manpower and skills to meet the needs of economic development. This factor, of course, depends largely upon continued educational efforts;

(D) Availability of jobs and increases in personal income resulting from productive efforts of the reservation should result in a higher level of economic activity and continued population growth.

3. Adequate public facilities and services should be available equally to all reservation residents.

(A) Safe and convenient roads should provide adequate linkage between the reservation communities and communities in the state, region, and nation beyond. Provisions should be made for use of all modes of transportation to meet the needs of reservation activities. Within the communities, local streets should provide safe, direct, and convenient access to each home;

(B) EACH RESERVATION TOWNSITE SHOULD HAVE ADEQUATE WATER, SANITARY SEWER, STORM WATER DRAINAGE, AND SOLID WASTE DISPOSAL SYSTEMS. INDIVIDUAL OR COLLECTIVE MEANS FOR PROVIDING THESE UTILITIES SHOULD BE REQUIRED IN THE RUAL OR REMOTE AREAS OF THE RESERVATION. ADEQUATE ELECTRICAL, GAS, AND TELEPHONE SERVICES SHOULD BE AVAILABLE TO THE GENERALLY INHABITED PORTIONS OF THE RESERVATION;

(C) RECOGNIZING THE DIVERSE DISTRIBUTION OF RESERVATION POPULATION, SCHOOLS SHOULD BE LOCATED SO AS TO ADEQUATELY PROVIDE A BASIC (12 GRADES) EDUCATION FOR EVERY RESERVATION CHILD. THE BEST AVAILABLE SYSTEM OF TRANSPORTING CHILDREN TO THESE SCHOOLS SHOULD BE UTILIZED. EDUCATIONAL PROGRAMS AVAILABLE ON THE RESERVATION SHOULD ALSO PROVIDE VOCATIONAL, ADULT AND CONTINUING TRAINING TO PREPARE RESERVATION RESIDENTS FOR SIGNIFICANT CONTRIBUTION TO THE AREA'S ECONOMIC DEVELOPMENT;

(D) COMMUNITY RECREATION FACILITIES AND ASSEMBLY SPACE SHOULD BE AVAILABLE AT EACH TOWNSITE TO MEET LOCAL NEEDS AND DESIRES. PARTICULARLY IMPORTANT IS THE NEED FOR PLAYGROUND FACILITIES FOR CHILDREN AND YOUNG ADULTS IN EACH COMMUNITY. ALSO, LOCAL FIRE PROTECTION EQUIPMENT AND OTHER PUBLIC FACILITIES SHOULD BE AVAILABLE AS NEEDED THROUGHOUT THE RESERVATION;

(E) EFFECTIVE MECHANISMS SHOULD EXIST ON THE RESERVATION FOR CITIZEN INVOLVEMENT IN LOCAL AFFAIRS. IMPROVEMENT IN COMMUNICATIONS AND INDIVIDUAL REPRESENTATION IN AFFAIRS AFFECTING THE ENTIRE COMMUNITY NEED TO BE IMPROVED FOR BOTH INDIAN AND NON-INDIAN RESIDENTS;

(F) SOCIAL WELFARE EFFORTS ON THE CROW RESERVATION SHOULD BECOME PARTICULARLY ATTENTIVE TO ALCOHOLISM AND THE PROBLEMS OF YOUTH;

(G) A COORDINATED SYSTEM OF RESERVATION HEALTH SERVICES SHOULD BE AVAILABLE AND PROVIDE SERVICE TO ALL RESIDENTS. RECOGNIZING THE DIVERSITY OF PUBLIC AND PRIVATE PARTICIPANTS INVOLVED IN HEALTH SERVICES, A COORDINATING BODY SHOULD BE CREATED AND FUNCTION TO BRING ABOUT OPTIMUM BENEFITS TO ALL FROM THE RELATIVELY SCARCE LOCAL HEALTH RESOURCES.

Realization of many of the above-mentioned goals has been treated in detail elsewhere in this planning report. An in-depth study concerned with Goal #1 above was the subject of the Initial Housing Element Study. Goal #2 above was studied in detail in the Population and Economic Study. Goal #3a was dealt with in both the Population and Economic Study and the Circulation and Transportation Element. The Community Facilities Plan considered Goals #3b, #3c, and #3d, as did the Population and Economic Study. The remainder of this report will deal with Goals #3e, #3f, and #3g which, while considered elsewhere, will be detailed at this point.

One can see from the above goal identification and discussion, that the content of this comprehensive planning effort has been very sensitive to and concerned with achievement of social, as well as physical, planning goals.

PRESENT SOCIAL SERVICES

In order to lend direction to planning for additional and extended programs of social and health services, it was necessary for the Consultant to make a thorough examination and analysis of existing programs and their effect on residents of the Crow Reservation. This examination and analysis was accomplished by first reviewing recorded information relating to social and health programs and secondly by including questions related thereto in the Consultant's survey of residents. Recommendations for future planning, as set forth hereinafter, were based upon the aggregate data obtained during the examination and analysis.

Recorded Data Analysis:

Available recorded information uncovered the fact that although the Crow Reservation has what could be termed as the "basis" for sufficient social and health service programming, a lack of organization, inability to obtain and keep a quantity of qualified personnel, and insufficient sources of funding impedes any real progress these programs might have on elimination of the detrimental social and health problems facing residents.

Proof that the limited social and health service programming does not have the intended effect on all reservation residents lies in the following factual data:

1. Incidence of a mild type of diabetes is very high among Crow Reservation adults. Although the reservation residents have access to a

DIABETIC CLINIC AND COUNSELING BY PHYSICIANS AND NURSES, THIS DISEASE CONTINUES TO CLAIM ITS VICTIMS;

2. THE INFANT MORTALITY RATE ON THE RESERVATION IS APPROXIMATELY 53 PER 1,000 LIVE BIRTHS AS COMPARED TO THE NATIONAL AVERAGE OF 22.4 PER 1,000 LIVE BIRTHS. THIS RATE EXISTS INSPITE OF THE OPERATION OF PRENATAL AND WELL-CHILD CLINICS ON THE RESERVATION. ESTIMATES INDICATE THAT 16% OF THE EXPECTANT MOTHERS RECEIVE NO PRENATAL INSTRUCTIONS;
3. TUBERCULIN CASES ON THE RESERVATION ARE MUCH HIGHER THAN THE NATIONAL AVERAGE FOR THIS DISEASE. ALTHOUGH THERE ARE DETECTION PROGRAMS THROUGH THE JAILS AND SCHOOLS, IMMEDIATE FOLLOW-UP ON NEWLY REPORTED CASES, MONTHLY CHEST X-RAYS THROUGH THE SCHOOLS AND CLINICS, AND VARIOUS OTHER SERVICES AIMED AT COMBATING THE INCIDENCE OF TUBERCULOSIS, IT IS ESTIMATED THAT APPROXIMATELY 40% OF THE RESERVATION CHILDREN AND A HIGH PERCENTAGE OF THE ADULTS RECEIVE NO BENEFITS FROM THESE SERVICES;
4. APPROXIMATELY 73% OF THE CHILDREN FROM AGES 3 TO 19 DO NOT RECEIVE THE NECESSARY DENTAL CARE. OF 399 ADULTS EXAMINED IN DENTAL FACILITIES DURING ONE YEAR, ONLY 14% RECEIVED THE RECOMMENDED AND REQUIRED DENTAL ATTENTION. PROSTHETIC APPLIANCES REQUIRED BY PATIENTS ARE SELDOM AVAILABLE, TOOTH DECAY AND PERIDONTAL PROBLEMS ARE FREQUENT, AND TRANSPORTATION TO SCHOOL DENTAL PROGRAMS IS OFTEN UNAVAILABLE;
5. INSPITE OF ACCIDENT PREVENTION PROGRAMS AND DRIVER'S EDUCATION CLASSES, THE 1968 MOTOR VEHICLE ACCIDENTS ON THE RESERVATION WERE 8.5 TIMES HIGHER THAN THE NATIONAL AVERAGE FOR MOTOR VEHICLE ACCIDENTS. MANY OF THESE ACCIDENTS WERE ATTRIBUTED TO DRUNK-DRIVING;
6. ALTHOUGH THERE IS A MENTAL HEALTH CLINIC OFFERING INDIVIDUAL AND GROUP THERAPY BY QUALIFIED PERSONNEL, SCHOOL MENTAL HEALTH PROGRAMS, AND VARIOUS OTHER SERVICES IN THIS AREA, PROBLEMS SUCH AS ALCOHOLISM, SUICIDE, EMOTIONALLY DISTURBED CHILDREN AND ADULTS, MARITAL BREAKDOWNS, ETC. STILL EXIST IN FULL FORCE. FOR EXAMPLE, INSTRUCTORS IN SCHOOLS ON THE RESERVATION ESTIMATE THAT APPROXIMATELY ONE-TENTHS OF THE STUDENTS SUFFER FROM EMOTIONAL PROBLEMS THAT HAMPER THEIR EDUCATIONAL AND PERSONAL PROGRESS; APPROXIMATELY TWO-THIRDS OF THE CARETAKER FACILITIES ON THE RESERVATION ARE NOT EQUIPPED OR QUALIFIED TO HANDLE

problems of an emotional nature; in the Fiscal Year of 1969, 563 hospital days were directly attributed to alcoholism, one out of every three Crow people who die each year have a history of alcoholism, and 80% of the accidents in Fiscal Year 1967 were attributed directly to drinking; and the suicide rate on the reservation is alarmingly high;

7. The crime rate on the reservation is much higher than the crime rate for the surrounding area and state. The crimes range from incest to rape to theft to assault with intent to kill. In short, they cover nearly every known spectrum of crime, are committed by both adult and youth alike, and affect the lives of nearly every resident on the reservation. Counseling available through the Mental Health Clinic, social workers, probation officers, and other concerned and qualified persons, and programs such as Neighborhood Youth Corps, summer camp, vocational training, etc. have had some effect on detering the crime rate. However, the problem is still a major one and demands intensified attention;

8. In 1968 the reservation labor force totaled 1,001 persons. Of this number, 440 were employed and 561 were unemployed. This constitutes an unemployment rate of 53.0% as compared to an unemployment rate of 4.7% for the State of Montana. Vocational training programs and remedial and adult education classes conducted on the reservation simply are not sufficient to qualify most residents for active employment. In addition, job opportunities simply are not in a quantity to employ all workable reservation residents, with or without skill qualification. As can be expected, this lack of skilled workers and employment opportunities has resulted in a median income level far below that of the state or nation, somewhat total dependency upon welfare and other supplements, and various other conditions directly linked with poverty;

9. Inspite of several housing projects enacted during the past few years, lack of sufficient housing is still a great problem on the reservation. In addition to the over-crowding and the number of substandard homes pointed out elsewhere in this report, many homes

on the reservation have poor sanitation and refuse disposal facilities. Sanitation personnel and programs in existence are simply not sufficient to overcome both the substandard housing and unsanitary living conditions;

10. Inspite of the educational programs conducted through the schools ~~and~~ special training services, a survey in 1968 indicated that 73% of the students enrolled in reservation schools were below grade average in reading and nearly equally below grade average in other subjects. Of the adults on the reservation, 59% have had only eight years or less of formal education.

In addition to those social and health service programs mentioned above, there are Head Start classes, eye examination clinics, environmental improvement programs, marriage counseling, special training programs, rabies clinics, legal assistance, and other service programs in operation on the reservation. However, even the combined efforts of all service programs are limited in scope and simply cannot and do not fulfill the needs of all the reservation residents. The sociological and health problems now facing the reservation continue to mount and continue leaving their marks on the reservation populace.

Survey Response Analysis:

Further proof of the overall inadequacy of existing social and health service programs on the reservation can be found in review of aggregate responses to survey questions related thereto. This survey was conducted by the Consultant and responses to social and health related questions were received from most of the Indian and non-Indian families residing on the Crow Reservation. The data was segmented into categories to portray local opinion regarding the availability and quality of existing social and health service programs.

As can be noted from Table A , Crow Reservation residents expressed a diverse perception regarding the availability and quality of existing social service programs. In general, the welfare area was rated average, with a mixed-quality response pattern ranging from average to below average to poor. Very few areas in social services were rated excellent, while a considerable number were rated poor. "Don't know" responses ranging from 10.8 to 51.3 percent indicated that the residents interviewed were inadequately informed about availability of programs.

Questions pertaining to relationships between individuals and groups

TABLE A

SUMMARY OF RESERVATION RESIDENT RESPONSES TO SOCIAL SERVICES RELATED QUESTIONS

Crow Reservation
1971

PERCENT DISTRIBUTION OF ALL RESPONSES

	Excellent	Good	Average	Below Average	Poor	Don't Know	Mean Score on 1 to 5 Scale
On the Reservation, governmental assistance in the area of welfare is generally	5.5%	17.4%	36.4%	9.2%	6.3%	25.7%	2.9%
Social Services available to all Reservation Residents is	0.6	8.9	15.4	8.2	35.0	31.9	4.0
Quality of Alcoholism Counseling to all Reservation Residents is	0.7	7.2	17.0	9.0	29.0	37.2	3.9
Quality of Drug Abuse Counseling to Reservation Residents is	0.2	5.1	5.6	9.4	33.9	45.7	4.3
Quality of Counseling on School Problems is	0.3	5.5	7.1	11.4	34.4	41.3	4.3
Quality of Counseling on Home Problems is	0.7	4.9	5.2	11.4	35.4	42.4	4.3
Quality and Effect of Suicide Counseling is	0.4	1.6	4.4	8.7	33.6	51.3	4.5
In general, day care centers for small children are	0.3	1.3	3.7	5.6	46.8	42.3	4.7
Law Enforcement of the Reservation should be rated as	1.3	18.5	35.7	14.3	16.4	13.8	3.3
Court Services on the Reservation should be rated as	1.0	10.5	18.9	15.0	26.1	28.4	3.8
Legal Services on the Reservation should be rated as	1.1	9.0	16.1	14.9	27.7	31.2	3.9
In General, relationships from Indians to non-Indians is	0.8	16.0	32.7	18.8	20.9	10.9	3.5
In General, relationships from non-Indians to Indians is	0.4	14.8	25.5	21.6	26.9	10.8	3.7

(continued)

Percent Distribution of All Responses

	Excellent	Good	Average	Below Average	Poor	Don't Know	Mean Score on 1 to 5 Scale
The relationship between Reservation and off Reservation Indians is	0.1%	15.2%	30.1%	11.9%	8.0%	34.7%	3.2%
The relationship between Tribal Officers and ~~the BIA~~ is	0.1	11.6	14.4	14.4	18.5	41.0	3.7
The general relationships between Tribal Political Faction is	0.1	7.8	10.5	11.2	33.0	37.4	4.1
In General, relationships from non-Indians to Indians is	0.4	14.8	25.5	21.6	26.9	10.8	3.7
The relationship between Reservation and off Reservation Indians is	0.1	15.2	30.1	11.9	8.0	34.7	3.2
The relationship between Tribal Officers and the BIA is	0.1	11.6	14.4	14.4	13.5	41.0	3.7
The general relationships between Tribal Political Faction is	0.1	7.8	10.5	11.2	33.0	37.4	4.1

PERCENT DISTRIBUTION OF INDIAN RESPONSES

	Excellent	Good	Average	Below Average	Poor	Don't Know	Mean Score on 1 to 5 Scale
On the Reservation, governmental assistance in the area of welfare is generally	8.5%	16.8%	42.2%	13.9%	8.0%	10.5%	3.0%
Social Services available to all Reservation Residents are	0.7	12.1	18.8	10.6	36.0	21.7	3.9
Quality of Alcoholism Counseling to Reservation Residents is	1.2	8.9	24.4	13.8	30.3	21.4	3.8
Quality of Drug Abuse Counseling to Reservation Residents is	0.5	6.9	6.2	15.1	38.5	32.8	4.3
Quality of Counseling on School Problems is	0.7	6.6	5.4	17.9	42.3	27.0	4.3
Quality of Counseling on Home Problems is	1.5	6.4	3.7	16.3	43.5	28.6	4.3
Quality and effect of Suicide Counseling is	1.0	1.0	5.2	14.5	39.2	39.2	4.5
In general, day care centers for small children are	0.5	1.7	2.7	5.9	60.4	28.7	4.7

(Continued)

TABLE A

Summary of Reservation Resident Responses
to Social Services Related Questions

Crow Reservation - 1971 (Continued)

Percent distribution of Indian Responses

	Excellent	Good	Average	Below Average	Poor	Don't Know	Mean Score on 1 to 5 Scale
Law Enforcement on the Reservation should be rated as	1.7%	18.7%	42.6%	17.5%	15.3%	4.1%	3.3%
Court Services on the Reservation should be rated as	1.2	15.3	26.8	21.2	26.8	8.6	3.6
Legal Services on the Reservation should be rated as	1.5	11.5	22.1	21.8	29.9	13.2	3.8
In General, relationships from Indians to non-Indians are	0.5	15.7	34.3	19.9	24.3	5.4	3.5
In General, relationships from non-Indians to Indians are	0.2	15.2	24.4	23.5	31.3	5.4	3.7
The relationship between Reservation and off Reservation Indians is	0.2	21.8	43.3	17.1	10.0	7.6	3.2
The relationship between Tribal Officers and the BIA is	0.2	14.5	18.0	23.6	26.6	17.0	3.7
The general relationships between Tribal Political Factions are	0.2	9.4	12.1	18.3	46.5	13.4	4.2

PERCENT DISTRIBUTION OF NON-INDIAN RESPONSES

	Excellent	Good	Average	Below Average	Poor	Don't Know	Mean Score on 1 to 5 Scale
On the Reservation, governmental assistance in the area of welfare is generally	3.0%	17.8%	31.7%	5.3%	5.0%	37.2%	2.9%
Social Services available to all Reservation Residents are	0.4	6.2	12.7	6.2	34.2	40.2	4.1
Quality of Alcoholism Counseling to Reservation Residents is	0.2	5.8	11.0	5.2	27.9	49.9	4.1
Quality of Drug Abuse Counseling to all Reservation Residents is	0.0	3.6	5.2	4.8	30.2	56.2	4.4
Quality of Counseling on School Problems is	0.0	4.6	8.4	6.0	28.1	52.9	4.2
Quality of Counseling on Home Problems is	0.0	3.6	6.4	7.4	28.9	53.6	4.3

(Continued)

Percent Distribution of Non-Indian Responses

	Excellent	Good	Average	Below Average	Poor	Don't Know	Mean score on 1 to 5 Scale
Quality and effect of suicide Counseling is	0.0%	2.0	3.8	4.0%	29.0%	61.2	4.5
In general, day care centers for small children are	0.2	1.0	4.6	5.4	35.7	53.2	4.6
Law Enforcement on the Reservation should be rated as	1.0	18.2	30.2	11.8	17.3	21.6	3.3
Court Services on the Reservation should be rated as	0.8	6.7	12.6	10.0	25.6	44.3	4.0
Legal Services on the Reservation should be rated as	0.8	6.9	11.3	9.3	25.9	45.7	4.0
In general, relationships from Indians to non-Indians are	1.0	16.2	31.3	18.0	18.2	15.4	3.4
In general, relationships from non-Indians to Indians are	0.6	14.5	26.3	20.1	23.3	15.1	3.6
The relationship between Reservation and off Reservation Indians are	0.0	9.8	19.4	7.6	6.4	56.8	3.2
The relationship between Tribal Officers and the BIA is	0.0	9.3	11.5	6.8	11.9	60.6	3.5
The general relationships between Tribal Political Factions are	0.0	6.4	9.2	5.4	22.1	56.8	4.0

SOURCE: Harrison G. Fagg and Associates,
Survey of Reservation Residents, 1971

on the reservation received an exceptionally high percentage of responses and, as a result, provided a high quality of responsive attitude. In general, inter-group relations were rated average or below average for residents of the Crow Reservation. Every age and racial group placed emphasis on the poor quality of relationships between tribal political factions and, to a lesser degree, on those between the Indians and the Bureau of Indian Affairs.

Indian respondents indicated that the availability and quality of suicide counseling and day care facilities were poor. The same two issues stood out as rating the lowest on the quality scale among the non-Indian respondents.

Similar patterns of quality perception for available social services were expressed. However, Indian respondents tended to rate the available services higher than did the non-Indian respondents. The opposite situation was true with regard to questions focussed on relationships between distinct reservation groups. In this case, the Indian respondents were more critical of the quality of these relationships.

As a rule, Indians were more aware of programs than were non-Indians. In fact, non-Indian respondents more frequently answered "don't know" to social service related questions than they did to any other questions analyzed.

Table B indicates total response to questions concerning quality and availability of existing health services provided on the Crow Reservation. As can be noted, medical services on the reservation were rated average or better by nearly 65% of the respondents. Overall, there was a high level of response to questions connected with health, thus indicating a high level of familiarity with these programs on the part of the reservation residents.

Deeper analysis of response patterns indicates that Indian respondents were far more willing to indicate their feelings on health questions than were non-Indian respondents and Indians, in general, rated health services higher than did the non-Indians. There is an agreement between the races that private medical care, private dental care, and private hospitalization on the reservation is poor. However, the medical health and dental services provided by the Indian Health Service (PHS) are held in high regard by the Indian population.

Reservation medical services, including hospital services, were rated higher than the dental services. Ambulance service on the reservation was held in very low regard. A high level of "don't know" responses by non-

TABLE B

SUMMARY OF RESERVATION RESIDENT RESPONSE TO HEALTH RELATED QUESTIONS

Crow Reservation
1971

PERCENT DISTRIBUTION - TOTAL RESPONSE

	Excellent	Good	Average	Below Average	Poor	Don't Know	Rank Score on 1 to 5 Scale
Medical Services on the Reservation should be rated as	6.9%	27.9%	30.0%	7.3%	14.0%	13.9%	2.9%
Hospital Services on the Reservation should be rated as	7.2	32.2	25.3	5.3	12.9	17.1	2.8
Health Services on the Reservation should be rated as	7.1	32.0	26.1	6.0	11.5	17.4	2.8
Dental Services on the Reservation should be rated as	7.0	27.6	22.0	8.0	16.3	19.1	3.0
Private Medical Care on the Reservation is	0.7	6.0	6.4	3.1	65.0	18.3	4.5
Private Dental Care on the Reservation is	0.7	6.0	6.1	2.7	66.4	18.0	4.6
Private Hospitalization care on the Reservation is	0.4	6.8	6.4	3.1	65.0	18.2	4.5
Ambulance Service on the Reservation is	1.1	14.4	14.5	13.2	43.9	13.0	4.0

PERCENT DISTRIBUTION - INDIAN RESPONSE

	Excellent	Good	Average	Below Average	Poor	Don't Know	Rank Score on 1 to 5 Scale
Medical Services on the Reservation should be rated as	9.0%	33.6%	37.5%	10.9%	8.0%	1.0%	2.8%
Hospital Services on the Reservation should be rated as	9.5	40.3	33.0	9.0	6.6	1.5	2.6
Health Services on the Reservation should be rated as	9.5	38.9	34.5	9.8	5.1	2.2	2.6
Dental Services on the Reservation should be rated as	9.6	34.4	26.8	12.3	12.3	4.7	2.8
Private Medical Care on the Reservation is	1.5	7.1	5.9	3.4	67.0	15.2	4.5

TABLE 8

SUMMARY OF RESERVATION RESIDENT RESPONSE TO HEALTH RELATED QUESTIONS

Crow Reservation
1971

PERCENT DISTRIBUTION - INDIAN RESPONSE

	Excellent	Good	Average	Below Average	Poor	Don't Know	Rank Score on 1 to 5 Scale
Private Dental Care on the Reservation is	0.5%	7.9%	5.9%	2.2%	68.8%	14.7%	4.5%
Private Hospitalization on the Reservation is	0.5	8.5	6.5	3.2	65.9	15.4	4.5
Ambulance Service on the Reservation is	1.7	18.1	18.1	17.9	36.8	7.4	3.8

PERCENT DISTRIBUTION - NON-INDIAN RESPONSE

	Excellent	Good	Average	Below Average	Poor	Don't Know	Rank Score on 1 to 5 Scale
Medical Services on the Reservation should be rated as	5.1	23.2	24.0	4.3	18.9	24.4	3.1
Hospital Services on the Reservation should be rated as	5.3	25.6	19.1	2.4	17.9	29.7	3.0
Health Services on the Reservation should be rated as	5.1	26.4	19.3	3.0	16.5	29.7	3.0
Dental Services on the Reservation should be rated as	4.9	22.1	18.2	4.5	19.6	30.6	3.2
Private Medical Care on the Reservation is	0.8	5.3	6.9	2.8	63.4	20.8	4.5
Private Dental Care on the Reservation is	0.8	4.6	6.3	3.2	64.5	20.6	4.6
Private Hospitalization on the Reservation is	0.4	5.6	6.3	3.0	64.3	20.4	4.6
Ambulance Service on the Reservation is	0.6	1.3	1.5	9.3	49.6	17.7	4.2

SOURCE: Harrison G. Fagg and Associates
Survey of Reservation Residents, 1971.

Indian respondents indicates a general lack of familiarity with the general unavailability of health services to non-Indian residents. It is interesting to note that the aggregate of non-Indian respondents rated private medical care slightly lower than did the Indian respondents.

As a rule, response information indicates that the level of health services provided to the Indians on the Crow Reservation is of higher quality than that provided to the total population.

Basic Recommendations Based on Examination and Analysis:

Service agencies on the Crow Reservation are sorely aware of the inadequacy of their existing programs to overcome social and health deficiencies facing the residents. In an effort to reinforce existing programs, these service agencies are working to secure funding for the following services:

1. Liberalized criteria in adult eyeglass programs and reduction of time between visits to optometrists;
2. Employment of additional Community Health Representatives and Health Educator Aides;
3. Ambulance service for reservation communities;
4. Construction of needed health clinics and dental facilities;
5. Employment of more male orderlies for work with male patients in the hospital facilities. This need is especially apparent in work with alcoholic patients;
6. Participation in Regional Indian Alcoholism program;
7. Participation in Multiple Service Center to provide services to all age groups and to cover problems such as delinquency, child neglect, mental health problems, alcoholism, drug abuse, etc.;
8. Retirement-nursing home facilities for the elderly residents of the reservation;
9. Construction and operation of receiving home and foster home facilities;
10. Assistance in contracting with septic tank cleaning firms;
11. Provision of operator and equipment to maintain district landfills;
12. Provision for maintenance and repair of sanitation facilities;
13. Construction of additional low-cost housing;
14. Providing mortician services for the reservation;
15. Providing additional vocational and special educational/training

programs;

16. Providing a job establishment program for the reservation.

It would be the Consultant's basic recommendation that efforts to secure funding for these proposed services be intensified. As can be noted, several of these services are aimed directly at some of the problem areas pointed out by survey response and recorded data. If put into action, these programs would assist greatly to eliminate the detrimental social conditions existing on the Crow Reservation. There are several Federal funding programs available, particularly to Indian reservations, that could offer assistance in the efforts to make these programs operational. Some of the Federal assistance programs discussed in a later section of this report could prove beneficial to enactment of these proposed programs.

Based on survey response, it would be the Consultant's second basic recommendation that immediate attention be directed to developing better relationships between the different groups of people on the reservation. Evidence presented indicates that a low level of communication is present, especially among the Indian respondents who indicated a decidedly higher level of below average and poor response for the inter-group relationships mentioned. This information flags the need for local level community development to encourage dialogue between the different groups. Since the population count on the reservation is quite minimal, perhaps a town-hall type meeting should be conducted on a tribal district level. If such meetings were held in an open manner, with all reservation residents welcome, mutually important problems and opportunities could be identified and discussed between diverse interest groups. As the end result, a better understanding of individual resident and community goals and aspirations and the coordinated development of programs could be achieved.

The lack of day care facilities was strongly reflected in the survey response data and the importance of these facilities to the individual welfare and economic growth of the reservation was indicated by the amount of response. As was pointed out in the Population and Economic Study, one of the ways in which personal income per capita can be increased is by increasing the number of workers per household. If proper day care facilities are available, workers otherwise unemployable, due to childcare duties at home, become employable. Construction and operation of additional day care facilities would be another basic recommendations of the Consultant. Available Federal assistance programs could be used in accomplishment of this recommendation.

Both Indians and non-Indians indicated that suicide counseling on the reservation was of very poor quality. Suicide is a major problem on the Crow Reservation and, as is usually the case, its treatment is rough, complicated and involved. Programs geared to preventing suicide are a must for the residents of the reservation. These programs should be coordinated through the existing Mental Health Clinic.

Based upon opinions expressed by reservation residents and the recorded information examined, one would conclude that attention on the Crow Reservation should be directed to providing medical, dental, and hospitalization to the non-Indian residents. Furthermore, there is apparent need for ambulance service on the reservation. Feasible alternatives include taking steps to make private medical care on the reservation more accessible to non-Indian residents. A program which brings medical service to the user, combined with a good public information program, might be useful to the area. Detailed discussion of a community health program is provided later in this report.

Efforts are now underway by service agencies on the reservation to institute ambulance service for the area. It might be feasible to consider this service on more than just a reservation level. It is the Consultant's opinion that establishing statewide performance standards for ambulance service and personnel would significantly change the quality of local service.

As mentioned previously, opinions expressed by the reservation residents indicated that both Indians and non-Indians are inadequately informed about social service and health programs available on the reservation. If these programs are to be in any way coordinated on the reservation, an informational program must become a part of the activities. In this manner, all residents can be made aware of the available programs and be able to evaluate their applicability, quality, and availability in relation to individual needs. This informational program could be combined with the community meetings mentioned earlier in this section.

SPECIFIC RECOMMENDATIONS FOR ADDITIONAL AND EXTENDED SOCIAL PROGRAMS

Alcoholism Services:

Alcoholism is a disease which is recognized by both health and social service fields. A large proportion of the failure of efforts to control alco-

HOLISM STEMS FROM THE POPULAR VIEW OF ALCOHOLISM AS A FORM OF WILLFUL MISBEHAVIOUR. THE SOCIAL PROBLEMS ASSOCIATED WITH THIS DISEASE, INCLUDING DEPENDENCY, FAMILY DISRUPTION, ACCIDENTS, CRIME, AND DELINQUENCY, ARE WELL KNOWN ON THE CROW RESERVATION.

THE CAUSE OF ALCOHOLISM IS NOT KNOWN. HOWEVER, MOST LITERATURE ON THE SUBJECT CURRENTLY INDICATES THE BELIEF AMONG EXPERTS THAT ALCOHOLISM IS LIKE MANY OTHER DISEASES IN THAT IT RESULTS FROM MANY FACTORS. PHYSIOLOGICAL FACTORS, SUCH AS METABOLISM DEFECTS, HAVE BEEN IMPLICATED BY SOME EVIDENCE. IN SOME CASES SOCIAL CONDITIONS HAVE BEEN IDENTIFIED AS CONTRIBUTING FACTORS. IT IS MOST WIDELY HELD, HOWEVER, THAT PSYCHOLOGICAL OR EMOTIONAL INADEQUACY IS INVOLVED AND, CONSEQUENTLY, MANY METHODS OF TREATING ALCOHOLISM ARE PREDICATED ON THIS POSITION. WHETHER OR NOT THIS IS THE PRINCIPAL CAUSE OF ALCOHOLISM, REMISSION IS FREQUENTLY BROUGHT ABOUT THROUGH TREATMENT OF EMOTIONAL PROBLEMS. IN EVERY CASE, THE CURRENT PROPER TREATMENT FOR ALCOHOLISM MUST STRIVE TO ACHIEVE OBJECTIVES CENTERED ON HELPING THE INDIVIDUAL MAINTAIN ABSTINENCE FROM DRINKING AND RETURN TO NORMAL LIVING.

TREATMENT OF ALCOHOLISM VARIES WITH INDIVIDUAL CASES. UNFORTUNATELY, THE MOST FREQUENT INITIAL TREATMENT IS JAIL. THE ONLY WAY THIS CIRCUMSTANCE COULD ACCRUE BENEFITS WOULD BE TO HAVE THE LOCAL COURTS TREAT ALCOHOLISM AS A DISEASE RATHER THAN AS A MISDEMEANOR. IN 1966 THE UNITED STATES COURT OF APPEALS FOUND THAT A CHRONIC ALCOHOLICS SUFFER FROM A SICKNESS AND CANNOT BE PROSECUTED FOR PUBLIC DRUNKENNESS. (DRIVER VS. HINNANT, 356 F. 2D 761 (4TH CIR. 1966)). THIS DECISION SUPPORTS COURT REFERRAL OF SICK PEOPLE TO HOSPITALS AND OTHER PLACES OF TREATMENT FOR ALCOHOLISM. ONE STEP THAT COULD BE MADE LOCALLY IN THIS REGARD WOULD BE TO INCREASE USE OF SUCH REFERRAL AS LOCAL COURT POLICY.

THREE PRINCIPAL APPROACHES TO DEALING WITH ALCOHOLISM EXIST TODAY. THE FIRST IS THE RESEARCH AND DEMONSTRATION TECHNIQUE WHICH PROVIDES TRAINING FOR TREATMENT BASED UPON FINDINGS OF SCIENTIFIC INVESTIGATION OF THE SUBJECT. STUDY AND DEMONSTRATION PROJECTS CAN BE ESTABLISHED IN THE AREA BY ANYONE OF MANY FEDERAL PROGRAMS, INCLUDING THOSE OF P.H.S., THE OFFICE OF VOCATIONAL REHABILITATION, AND CONSTITUENTS OF THE DEPARTMENT OF HEALTH, EDUCATION AND WELFARE. USE OF SUCH RESOURCES ON THE CROW RESERVATION SEEMS DESIRABLE.

ALCOHOLICS ANONYMOUS PROVIDES A SECOND APPROACH TO SOLUTION OF THE LOCAL ALCOHOLISM PROBLEM. THIS METHOD INVOLVES ALCOHOLICS THEMSELVES WHO APPROACH THE CONTROL OF THEIR DISEASE THROUGH A FELLOWSHIP WHOSE PURPOSE IS TO HELP EACH OTHER REMAIN SOBER. THESE LOCAL ORGANIZATIONS ARE HIGHLY RESPECTED FOR their success in helping to rehabilitate thousands of alcoholics.

An affiliated organization called Al-Anon is made up of families of alcoholics and other persons interested in overcoming this problem. This organization provides a useful level of community support for the Alcoholics Anonymous groups. A well organized and strong Alcoholics Anonymous group supported by an equally strong Al-Anon organization in each principal community on the reservation could help deal with alcoholism at the individual and community level.

A third approach to alcoholism control is through the National Council of Alcoholism. This voluntary health organization is devoted to information, education, research, and promotion of services. It represents the point of view of the concerned public. Local organizations such as Al-Anon can affiliate with this Council to focus on reservation alcohol education efforts.

Prevention of epidemic alcoholism depends largely on community-wide education regarding it and early diagnosis and treatment of the individual. Many of the schools in Montana have included limited alcohol education classes in their health programs. This unit should be strengthened in reservation schools by stressing factual information relevant to the reservation alcoholism situation. Non-school educational efforts geared to the young and developed in cooperation with governmental and voluntary association resources should be enacted to cultivate realistic attitudes and to foster intelligent decisions about the use of alcohol.

A comprehensive attack on alcoholism on the Crow Reservation will require cooperation from many local agencies and resources. Both hospital care and outpatient services, either in a clinic or doctor's office, are required. Also, psychotherapy, AA membership, social casework, and social/vocational rehabilitation are necessary. Of course, the police and the courts should be involved as noted earlier. All available means of public information and education should be used to present the facts about alcohol in order to reinforce public acceptance of alcoholism as a disease from which sufferers can recover if provided with proper treatment. In addition, the potential roles of schools and churches should not be minimized as a medium for providing the necessary information, particularly to the young.

The leadership necessary to combat alcoholism successfully may be difficult on the Crow Reservation. This leadership would have the responsibility of coordinating every available resource and utilizing each to the maximum. An Al-Anon group might be officially recognized by local elected officials as the focus of efforts to relate local resources in overcoming this serious health and social problem. Such an officially recognized group, especially if it contained representation from the interests mentioned above, would have the success record of Alcoholics Anonymous, the potential to obtain assistance through Federally funded research programs and demonstration projects, and the ability to carry out a concentrated and on-going public information program.

These steps, if successfully combined with law enforcement, medical, and psychological professional's services, should be expected to significantly influence reduction of alcoholism on the Crow Reservation.

Services for Youth:

Today's young resident of the Crow Reservation is subjected to enormous change and is in need of effective means of assisting him to deal with it. Those groups feeling the greatest impact of this change are the youngsters with a purely agricultural background, youngsters of poor families, and youngsters of Indian heritage.

For the youngster with an agricultural background change is often foreseeable in his later life pattern simply because of the increasingly lower manpower requirements of agricultural activity. Very few farm youngsters fail to realize that a successful life's activities will require leaving their current rural home.

Problems of change facing the youngter of a poor family are obvious. Financial inadequacies impede his educational, personal, and social advances.

The Indian youth, however, faces the most severe problems. For cultural and identity reasons, he holds a strong affinity for the reservation and its people and it is probable that he will never leave them permanently. At the same time, he and his people are undergoing significant cultural change. For example, his grandparents may hold to traditional Indian values and may live traditional Indian lives. His parents may have had some formal education and may hold a recognition of its necessity for success in the contemporary world, but have not themselves participated fully in it. The youngster finds himself caught in the midst of these changes and influences within his own home. Coupled with this are the recognition of insufficient job opportunities on the reservation and familiarity with the social ills present in his environment and, possibly, within his own home. The result of such influences on any youngster would court individual development disaster.

While many problems need to be overcome in order to improve the situation of those youngsters who grow up under these conditions, two principal programs could help the individual child to deal with it. The first of these programs involves insuring proper maintenance of personal health and the second involves an expanded program of functional education to prepare the individual for the productivity necessary for the satisfaction of a full life. In addition, effective utilization of many of the contemporary organized youth activity programs seems applicable to the Crow Reservation situation.

School Health Program: The need for a healthy body is essential to the growth and development of the young. During the school years, all children should have not only treatment for illness and injury, but should also receive periodic screening for conditions that should be corrected and, subsequently, should receive services to achieve the needed correction. Both private and public resources must be involved in providing these services. This assumes the availability of public and private health programs, dentists, and medical specialists concerned with pediatric and adolescent care. Often, even when the needed resources are conveniently available, this is not sufficient since many people seek medical help only when their children are in obvious need of the same Consequently, health defects among many children are not detected until they become serious. Some of these defects often going unnoticed are hearing and visual problems that can seriously interfer with the individual's learning and formative years and, later, with his success as a productive adult. Early recognition of such health problems through the proper diagnosis often leads to correction or alleviation.

The young are the most accessible through the schools. Almost all members of this population group, whose health maintenance and improvement are important for their individual futures, can be most satisfactorily accommodated through the schools. During the years in school, individual health attitudes and habits are formed while services related thereto are being received. The impact of this experience is usually lifelong. Although health is only one of the many goals of education, it has long been recognized as a proper concern of the schools.

Central to the school health program are assurances of healthful school conditions; appropriate health and safety education, including units on birth control, alcoholism, and drug abuse; effective and comprehensive school health services; healthful physical and sports programs; as well as qualified school personnel prepared to assume special responsibility for the school health program. Carrying out such a school health program requires the support and participation of the school board, school personnel, providers of such required health services, students, and parents.

Also essential to a successful health program is effective communication and coordination between the many agencies involved and the schools. A frequent block to realization of the potential impact of a school health program is contained in the poor coordination between the school and the providers of the required health services. While the school provides an excellent point at which detection of defects can be initiated, the schools cannot usually undertake provision of the actual health services required. Thus, the school health program must become a part of a comprehensive reservation-wide health service system rather than an isolated program if it is to achieve its true potential.

School children should be screened annually for vision, hearing and other defects. Importantly, follow-up services are necessary to see that proper treatment is acquired by those who need it. Follow-up requires communication of the urgency of treatment to the parents and health authorities. The school should be prepared to refer parents to appropriate health resources to provide needed services, especially in the case of low-income and Indian families who can avail themselves of assistance available for this purpose.

Organizationally, the reservation's school health program should be a joint effort of the local school board and Public Health Service. Also, the church operated schools should participate in the program so that all the reservation youngsters can be reached and included in the program's benefits. Many benefits can accrue from a close cooperation between schools and the reservation's principal health resource organization. While Public Health has the needed background of health information for carrying out the program, very few school personnel are well prepared to conduct all of the services suggested. Formal and continuing working relationships between these organizations can provide the expertise personnel, motivation, stimulation, and assistance necessary to maintain this program for a long period of time at a high level of operation. Formalization of the inter-relationship between the schools and the Public Health Service will provide qualified health professionals to consult with students, parents, teachers, and school administrators. Also, the rapport of the school board with the community can be supported by Public Health authorities as part of the necessary educational program for reservation children.

Functional Education Program: Realization of the goal of educating the young is crucial to the Crow Reservation's future. As a social problem, the educational task of providing education, in rural and predominantly Indian communities, that will prepare the young for a full and productive life in the future world requires an extraordinary educational program. Based upon the local cultural traditions of learning, considerably more emphasis should be placed upon learning by doing and individual attention to student's needs. Education should provide students with the opportunity and encouragement to pursue college, university and other "past high school" education which will qualify them for professional and business careers. Also, education should open the doors to positions in every walk of life and at every level of economic activity to insure that no one is denied employment and the opportunity for advancement because of inadequate, inappropriate or incomplete education.

Basic to the concept of functional education is the realization that wage and salary payments are each year making up a greater proportion of personal income. If tomorrow's citizens are to share in economic advance, they must have jobs. Education for tomorrow's jobs must provide basic knowledge, skills and the capacity to learn more. The capability of effective communication is probably more important as preparation for a successful life than the development of specific skills.

There is not a great difference between the needs of current vocational and adademic education. Both should be designed to prepare the young for a productive life in the world of work; both should provide him with the grounds for increasing his intellectual abilities; both should further his originality and creativity, refine his sensibilities and help him to find meaning and purpose in his life. In no case should the choice between vocational and academic cirricula be a choice of educational quality, but rather it should be one of educational appropriateness for the individual opportunity for choice among various life patterns, and a diversity of occupations which education can make possible. The task of functional education is to make individual choice real and viable.

To achieve economic goals it has established and provided for the young, the Crow Reservation needs to focus attention not only on the opportunities afforded through higher education, but on effectively typing schooling with job opportunities. For this to be achieved, business, industry and education must come together in partnerships that combine basic education with practical experience in on-the-job training. Such a program should realize the need for individual attention and involvement and certainly must be relevant to today's world and jobs. There is no need to train the young for obsolete jobs or activities or for those in which there is little or no hope of finding work. Successful joint ventures in functional education will require subsidization and experimentation with new ideas and ways joining education and work. The central issue of a functional education program for the youth of the Crow Reservation is how to bring them into the mainstream of contemporary economic activity in a technologically and industrially grounded society and, in many cases, to break the poverty cycle and cultural confusion in which they are entrenched.

It is a well established fact that to motivate a student to be an active, interested and, consequently, successful participant in the educational process requires individual perception that education is significant and worthwhile and is something that he, the individual, can attain. Recognition of individual progress in education, perception of success, and satisfaction in life are all necessary parts of the process. If what the student learns through education is to become part of his life and important to it, he must find opportunity in his daily life to use what he has learned and to have continuing practice in using it.

In former generations, young Crow Indians learned through both formal and unplanned experiences with their elders which involved their constructive participation. For the most part, functional education must strive to provide this type of experience in today's world. Consequently, functional education programs need to start at the lower school levels and should increase involvement during the higher grades.

Through this program students must realize how education will help them to deal with life. The functional education program must be designed to deliberately do so. Unfortunately, many reservation youth are not properly prepared through present educational programs to either deal with life in today's society or to participate in the world of work. Ways to improve this situation within the general framework of a functional education program are available and have been tried and proven. Of course, detailed planning of such a program is the provenance of educational experts. However, some desirable attributes of such a program are identified herein.

While increasing need for educated people is recognized, the current educational system available to the Crow Reservation fails to effectively serve most students, especially those at the high school level. Many students will drop-out before completing high school and many of those who remain in school will make very little progress during the last two years of their schooling. Among those students who graduate from high school, many will not possess the skills, habits and attitudes necessary to obtain desirable employment or participate in the life of their communities. These failures, which are apparent from discussions with teachers and students on the reservation, are probably not the result of personal inadequacies. More than likely, they are the results of inappropriate programs to bring these students the education they badly need. Both Indian and non-Indian youth on the Crow Reservation have reasonably high levels of aspiration. However, many do not see the connection between the content of present high school educational programs and their personal concerns. Because of the relevance of educational programs to their present and future lives is not apparent, many students drop-out or lose interest in school.

Educational practice by tradition stands in the way of programs which students can see readily as functional to their lives. Schooling should not be an island outside the mainstream of adult life. Changes on the reservation have increasingly excluded the young from the adult world at a period in their lives when they are looking forward to being adults. Young Crow Reservation residents need to relate to adults, to work with adults, to learn adult skills and practices, and to feel that they are becoming mature and independent. Factors such as lack of youth employment opportunities, limited chance of learning adult skills at home, and segregation of community activities by age groupings all contribute to the youngster's problems and increase his anxiety about achieving the status and competence of an adult.

Functional education should help to overcome these problems.

If it is to significantly alter these problems of the young, functional education must include close active relation between the school system and the reservation community so that students can apply what they learn to questions and problems outside the classroom. Emphasis in functional education should be placed upon learning those things that are relevant to the student's present and future life and not upon grades or other traditional symbols of educational attainment. In such a program, the school is used as the vehicle by which students learn the things they need to deal with life itself. It certainly is not the only place where this is accomplished, but it can help the individual increase his efficiency and effectiveness in the process.

To get specific, if reservation education is to become functional, opportunities need to be developed providing students with a chance to carry on significant adult or near adult activities. This can take the form of jobs, community service activities, apprenticeships, or other participation in situations where significant problems are dealt with and important work is done. Importantly, these need to be situations where learning is important to participation. Obviously, major adjustments will be needed in the operation of the schools in order to make this possible. Schools will need to be open to serve a wider range of age groups and must allow students to vary the amount of time spent in either study or work-type activities.

The concept of functional education is complex and its extralities may easily be misunderstood. It involves using adult-type activities and relationships with responsible adults in real life situations as a laboratory in which the young reservation resident can participate in the solution of real problems that require learning and in which they can use and sharpen what they are learning in schools. There is no intention in proposing a functional education program that stresses learning on-the-job as a substitute for deeper insights, knowledge, and skills attainable through formal education. The resources of his community should be used by the student as he works on practical problems and carries through projects in which he is engaged. Through doing work which can be perceived as significant, the student can see for himself that many kinds of learning are helpful to him. Coordination is required on the part of the educational professionals who must be able to select the content

OF SCHOOL WORK AND ASSIST STUDENTS IN USING IT IN CONNECTION WITH THE NON-SCHOOL ACTIVITIES IN WHICH THEY BECOME ENGAGED.

BECAUSE OF THE PRESENT SHORTAGE OF JOBS ON THE CROW RESERVATION, MOST OF THE NON-SCHOOL PORTION OF THE PROPOSED FUNCTIONAL EDUCATION PROGRAM COULD FOCUS ON CIVIC AND SOCIAL SERVICE ACTIVITIES. PRODUCTIVE COMMUNITY IMPROVEMENT EFFORTS IN EACH RESERVATION COMMUNITY COULD RESULT FROM THE USE OF THIS POTENTIAL YOUNG RESOURCE. THROUGH INVOLVEMENT IN SUCH COMMUNITY DEVELOPMENT EFFORTS, THE STUDENT CAN FACE PROBLEMS THAT INVOLVE VALUES, ETHICS, PERSONAL INTEGRITY, PUBLIC POLICY AND THE IMPORTANCE OF BASIC SKILLS TO COMPETENCE WHICH ALL RELATE TO REAL LIFE.

THE MAJOR TENNANTS OF THE PROPOSED FUNCTIONAL EDUCATION PROGRAM HAVE BEEN WIDELY UTILIZED IN VOCATIONAL EDUCATION PROGRAMS THROUGHOUT THE COUNTRY. COMBINING SCHOOLING AND ACTIVITY PROGRAMS HAS PROVED SUCCESSFUL IN THESE INSTANCES. THIS PROPOSAL IS ADVANCED FROM THE SCOPE OF ITS UTILIZATION FOR BOTH TERMINAL EDUCATION STUDENTS AND THOSE WHO ANTICIPATE FURTHER EDUCATIONAL DEVELOPMENT.

A SUCCESSFUL EDUCATION PROGRAM CAN AROUSE INCREASED EFFORT TOWARD AN INTEREST IN EDUCATION AMONG THE CROW RESERVATION'S YOUTH. IT CAN IMPROVE OPEN CLASSROOM INSTRUCTION, INCREASE STUDENT UNDERSTANDING OF THE SUBJECTS; AND DEVELOP INDIVIDUAL MATURITY, RESPONSIBILITY AND JUDGMENT. TWO SPECIFIC COMMUNITY SERVICE PROGRAMS WHICH COULD BECOME INVOLVED WITH THIS PROGRAM TO PROVIDE OPPORTUNITY FOR STUDENT INVOLVEMENT COULD BE PATTERNED AFTER THE FRIENDS SERVICE COMMITTEE AND THE NEIGHBORHOOD YOUTH CORPS. INVOLVEMENT OF A BROAD RANGE OF PEOPLE IN EDUCATION OF THE YOUNG IS DESIRABLE AS IS THE PROVISION OF A VARIETY OF PATTERNS OF ATTENDANCE. THESE PATTERNS OF ATTENDANCE WOULD INCLUDE FULL AND PART TIME ENROLLMENT, PART TIME ENROLLMENT WHILE HOLDING FULL OR PART TIME JOBS, OR ENROLLMENT AFTER A PERIOD OF WORK, MILITARY SERVICE OR OTHER ENDEAVORS. SUCH A VARIED PATTERN OF EXPERIENCE AND TRAINING CAN BE USED CONSTRUCTIVELY BY SCHOOLS RESPONSIVE TO THE RESERVATION'S NEEDS. OF COURSE, IF SCHOOLS OPERATE IN A TRADITIONAL MANNER, THEY WILL LIKELY REMAIN TRADITIONALLY INEFFECTIVE. REALIZATION OF SUCH A PROGRAM WILL REQUIRE DEVELOPMENT OF AN APPROPRIATE CURRICULUM, CHANGING THE ORGANIZATIONAL AND INSTITUTIONAL ARRANGEMENTS OF SCHOOLS IN EXISTENCE, AND TRAINING OF MANY PEOPLE FOR ROLES IN THE PROCESS OF EDUCATION. IN LIGHT OF THE PRESENT PROBLEMS FACED BY TODAY'S CROW RESERVATION YOUTH, SUCH A LARGE SCALE PROGRAM SEEMS WARRANTED.

Voluntary Youth Activity Programs: The vigor of youth and the importance of interpersonal relationships in wholesome activity during the formative years is the focus of attention of many voluntary organizations. A leader in this activity could be the churches. Several denominations are represented on the reservation. They could serve as focus point of much youth activity. Formal youth organizations including, but not limited to, scouting, FFA, 4-H, Boy's Club, and Girl's Club provide mechanisms for youth development and activity that is badly needed on the Crow Reservation. While this study cannot prescribe exactly which of these youth organizations would be most appropriate or likely to meet with success, the strength of such groups in know-how and tradition of success warrants their utilization. To get the ball rolling in this regard requires leadership. It is suggested that the local churches could perform a needed function by putting together such groups on the community level. Once the tradition of participation is established, it could be continued into adult life through establishment of local chapters of any of the numerous nationally affiliated civic organizations.

Program for Human Relations:

Relationships between the diversity of groups present on and influencing the Crow Reservation were rated generally poor in the survey of residents. This is a local problem which can be lived with like a disease which will lead to greater community disability, or it can be one which is faced head-on and dealt with in an intelligent manner with the potential result of community development. Throughout the planning reports submitted under the present contract, considerable attention has been focussed on the need for effective citizen involvement in achievement of many reservation goals. If the recommended citizen involvement mechanisms are successfully established and carried out, not only will progress be made toward achievement of basic reservation goals, but also significant gains should be realized in communications and relationships between individuals and groups that make up the total population.

A direct method of dealing with poor communications and poor relationships between diverse groups that has been successfully employed in many communities is an organizational mechanism developed specifically for and addressed to overcoming this weakness. A local council on human relations could be initiated with the specific objective of improving relationships between a wide spectrum of interests. Such a council is usually a forum open to the public and meeting regularly for discussion of topics of general local interest. The council also could concern itself with specific communication and group relationship problems on the reservation by providing a place for discussion of group differences in an orderly manner and by exerting its organizational influence upon such divergent groups to make them realize the goals of opening communications and relieving poor group relationships.

The key to creating such a council is obtaining dedicated, capable and continuing leadership. A council on human relations must be voluntary and united to any special interests on the reservation. It must represent a significant cross-section of the population to be successful. Certainly, both Indian and non-Indian people need to be represented as do the young, old, poor, townspeople, farmers, ranchers, churches, and any other group desiring representation and participation. Success by such a council requires a great deal of time and effort. If leadership and participation are present for a sufficient period of time, this tool could help improve communications and group relationships on the Crow Reservation.

Coordinated Health Service System:

There exists today a considerable amount of awareness and concern regarding health. Personal health is strived for by all mainly because of the freedom from illness and disability that it provides. Most residents of the Crow Reservation prize their independence and recognize that health, or the absence of illness, is one of the qualifications for maintaining it.

Over the past fifty years, an enormous amount of knowledge has become available in the field of health and medicine. At the same time, the public has become better informed and able to voice their concern over circumstances affecting the well-being of their communities. Public health programs and preventative medicine programs which contribute to providing the health services that the public demands have been developed.

In order to recognize the state of this art, one must realize that health and medicine have changed considerably during this century. Accomplishments of health and medicine in controlling communicable diseases have been remarkable. The hazards of childbirth and infancy have been dramatically reduced. It is important to note, however, that in economically depressed areas the maternal and infancy mortality rates, which are considered to be indexes of public health status, are several times higher than the national and state averages. The reason for this is that high quality health services are not always available to such people. If they are available, these people often do not use them. Substandard living conditions influence the total health status for the poor.

Public awareness that health services can influence personal well-being has created the expectation among most people that such services will be available. Some services provided by the public sector have come to be regarded as a right very similar to the right of public education. When these expectations are not filled, public reaction is considerable.

In recent decades, the focus of public concern for health matters has changed, thus reflecting the medical advances being made. Chronic diseases have become an important health issue. Accidents are recognized as a serious health problem. Mental illness and alcoholism cause great concern to medical professionals and to the lay public. The result of this concern has been multiplication of research efforts to find ways of preventing these diseases, accidents, mental illnesses, and alcoholism.

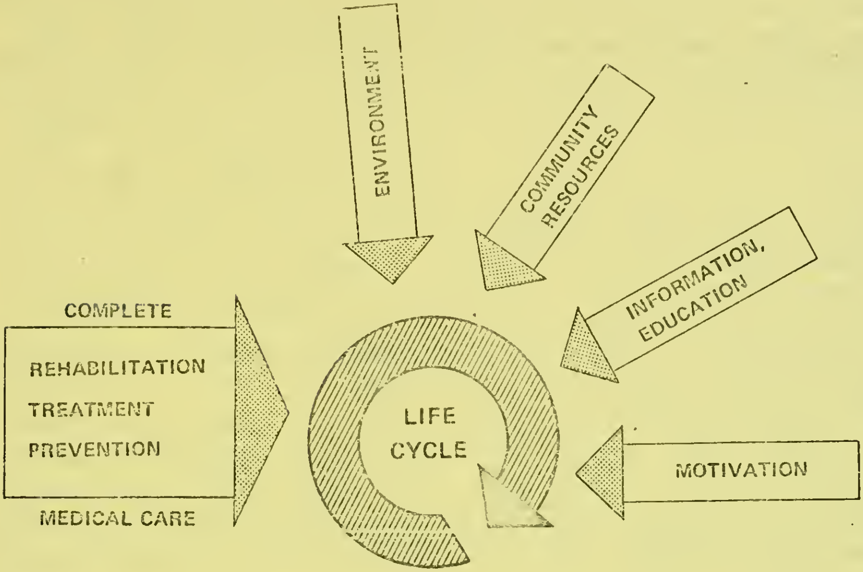
A wide range of resources for promotion of health and the treatment of illness exist today. However, a new problem has been created by the confusion to residents presented by the diversity of health programs. As a result, the potential for fulfilling current medical skills is reduced by the number and complexity of health programs, thus rendering many of the professional specialties ineffective.

Motivation is also a problem in connection with health services. Even well-informed people usually recognize the importance of health service only in special health conditions such as pregnancy. The person who does not concern himself daily with maintaining good health usually does not get treated for his symptomatic ailments.

Another related problem arises from splitting the service for treatment of one disease or health condition. This type of treatment includes one agency providing screening services, another agency providing diagnostic services, and a third agency providing treatment and rehabilitation service. At every successive referral, a certain number of people drop-out of the health services project. Sometimes the division of labor omits an essential compenent so that no one service is truly effective.

As is normally the case, some services on the Crow Reservation are duplicated and others are lacking. Health programs and services are often maintained in rigid government organizations long after they are needed, thus precluding development of new programs.

HEALTH SERVICES INFLUENCES UPON THE INDIVIDUAL'S LIFE CYCLE



COMPREHENSIVE COMMUNITY HEALTH PROGRAM: IN LIGHT OF THE VARIETY OF PARTICIPANTS IN THE PROVISION OF HEALTH SERVICES ON THE CROW RESERVATION AND IN RECOGNITION OF SOME OF THE GENERAL TRENDS EXISTING IN THE HEALTH FIELD, IT IS RECOMMENDED THAT THE CROW RESERVATION INSTITUTE A COMPREHENSIVE COMMUNITY HEALTH PROGRAM. SUCH A PROGRAM SHOULD BE DESIGNED TO MEET ALL THE REQUIREMENTS OF HEALTH FOR INDIVIDUALS AND THE COMMUNITIES. THE SERVICES PROVIDED SHOULD BE READILY AVAILABLE AND USED BY THOSE WHO NEED THEM.

A MEANS OF ACHIEVING THIS GOAL IS, TO A GREAT EXTENT, A MATTER OF ADMINISTRATION RATHER THAN A SCIENCE OR MEDICINE. THE MAJOR TASKS TO BE UNDERTAKEN INVOLVES COORDINATION OF ALL COMMUNITY HEALTH RESOURCES SO THAT THEY OPERATE AS A UNIFIED SYSTEM PROVIDING UNINTERRUPTED HEALTH SERVICE FOR THE COMMUNITY AND ITS INDIVIDUAL MEMBERS AND DEVELOPMENT OF KNOWLEDGE AND ATTITUDES THAT WILL RESULT IN THE PUBLIC OBTAINING MAXIMUM BENEFITS FROM ALL THE AVAILABLE SERVICES. THIS COMPREHENSIVE COMMUNITY HEALTH PROGRAM ENVISONS INDIVIDUAL HEALTH NEEDS AS CONTINUOUS AND INCLUSIVE. IT SHOULD INCLUDE COMPLETE MEDICAL CARE WHICH INVOLVES NOT JUST THE TREATMENT FOR ILLNESS AND INJURY BUT ALSO all of the protective procedures that can prevent disease or reduce disability. It should include therapuoic, educational, and prospective rehabilitative measures that can make possible the fullest use of individual capability. The program should go beyond what has normally been included in medical care and encompass such things as dentistry and dentures, hearing aides, and eye-glasses. The program should also recognize that information is necessary for each person to know what steps he can take to insure his individual health and that of his family and to motivate him to take necessary actions. Thus, a concept of the proposed comprehensive community health program for the Crow Reservation includes help for individuals to perceive their health needs accurately. Recognizing the diversity of the population on the Crow Reservation and realizing that certain population groups receive health benefits while others do not, the intention of this program should be to include both private and public resources within its concern.

The first concern of the proposed comprehensive community health program should be the physical environment as it results from concentrated human habitation in towns on the Crow Reservation. Specifically, systems to provide clean water and dispose of waste should be dealt with. Also, the health program must be responsive to social change and extension of health knowledge and skill. It is well recognized that the individual citizen derives only limited benefit from the potential of medical science. Consequently, the reservation must organize itself to help the individual obtain more of what is available. The greatest single need on the Crow Reservation is coordination of the area's resources and identification of potentially available resources near-by that would supplement those available locally in the provision of health care. Obviously, a small population such as is present on the reservation cannot support a diversity of medical specialists. However, information on where such specialists can be obtained should be available on the local level.

The Crow Reservation's health services are provided by a combination of voluntary organizations and governmental agencies. Voluntary organizations, such as VISTA, provide direct personal services. The health function of the government has many facets. For example, the Indian Health Services provides hospitalization, environmental sanitation, control of communicable diseases, maternal and child health services, health education and recording of vital statistics. Hospital care for off-reservation special population groups and

Certain rehabilitation services are also provided by the Indian Health Service. When one gets beyond the area of government services, however, classification by type of program is difficult because division of functions and responsibilities is not clear. Non-Indian residents must go off the reservation for any health services. The proposed community health program is envisioned as encompassing all the voluntary, private, and public agencies which are concerned with health and coordinating their services to insure maximum benefits to all reservation residents.

Three major activity areas make up the comprehensive community health program. The first activity area is comprehensive medical care which would include therapeutic and preventative care. The concept of comprehensive medical care also focusses on the individual's general health rather than on his immediate illness. The second activity area would be concerned with personal health services, including those that individuals received directly as opposed to those affecting them through the environment or other indirect means. The third activity area would be health education. Techniques for distributing information about health, encouraging its acceptance, and fostering relationships with groups of the population that will promote positive attitudes about health services are all included. Incorporation of these major health services areas and the available local resources into a system of services for the total health of the reservation and its citizens is the objective of a comprehensive community health program.

Recognizing the variety of auspices under which reservation health services are provided, it is important to also realize that leadership for the services is also dispersed among many areas. The Public Health Service, because it serves as the predominant provider of a range of programs on the Crow Reservation, should be considered as the most suitable source of leadership for the comprehensive community health program. Essential qualifications for leadership of this program include the following: (1) a detailed knowledge of the community as a social and physical environment, its patterns of disease, its health organizational structure, its cultural composition and (2) the ability to work successfully with many different people of diverse interests and to persuade and negotiate skillfully for establishment, maintenance, coordination, and utilization of all reservation programs. Leadership in the comprehensive community health program also requires a commitment beyond the limits of traditional public health activities to the broader concept of a comprehensive health program.

The program proposed must be built upon the structure that already exists on the reservation. Community health services have evolved under various auspices at separate times and for different purposes. A long-time separate existence has tended to dispose them toward separate rather than united reaction. Through utilization of existing organizational arrangements, part of this problem can be overcome.

Continuous productive communication among people on the reservation is basic to accomplishment of the comprehensive community health program's objectives. The Public Health Service is looked to for accurate information and guidance on health subjects. Communication, however, must go beyond dissemination of information. It must include listening and discussing with both groups and individuals. This activity should be emphasized by the Public Health Service. While it is only one of many organizations conducting communication activities on the Crow Reservation, it is unique in its breadth of subject matter and in the size and diversity of population with which it deals. At all times, the leadership of the reservation's community health program must recognize that there are two diverse groups present on the reservation for which these total services must be available.

Health Program Coordinating Council: Of course, overall disorganization would exist if the providers of health services were completely detached from each other. Agencies quite naturally establish relationships with each other and sometimes even formalize them through inter-agency committees. However, these relationships are normally limited to specific endeavors. In many communities, councils of health agencies have been formed. Such councils are aimed at exchange of information to help eliminate duplication of efforts. In the United States today, over 2,000 health and welfare councils exist as members of the United Community Funds and Councils of America (the national organization). The purpose of these local councils is to coordinate health and welfare services and to move toward cooperative community planning for such services. It is recommended that a health program coordinating council be created for the Crow Reservation in order to serve these purposes. The program of this council can be general, but should be aimed at reservation problems and should involve agencies administering local programs. The council should also provide information services and carry on educational activities. Membership in this council should include not only voluntary and governmental health and welfare agencies but also citizens representing community forces and the public served as well.

Organizationally, the trend in local health councils is away from structures dominated by agencies to structures in which the major responsibility rests in the hands of leading citizens. This type of organization is probably more favorable to the development of community leadership than one in which all members represent individual agencies or interest groups.

The health program coordinating council on the Crow Reservation should be an independent organization. Financing of the health program coordinating council can vary. However, the National Health Council recommends that local councils should be financed as much as possible by contributions from the participating agencies. Funds may also be obtained by awards from foundations and governmental agencies. The method by which the council is financed can be reflected in the emphasis of its activities.

Activities of the health program coordinating council could cover a considerable range of subjects and could include meetings, workshops, and conferences. Surveys, studies and research and negotiations to affect the recommendations growing out of any studies are conducted by member agencies. The nature of the proposed local council's activity also depends on its strength, size, and objectives. It has a great potential for serving the reservation through leadership and coordination, even without a full-time staff. A council can serve as an association of agencies for the purpose of exchanging information. This alone would be a valuable function. It would result in positive action toward improvement of reservation health services. The council should not have authority over other agencies, but should, instead, bring about positive action only by persuasion. If the council represents the community as a whole, it may be able to effect improvement as a result of public demands.

The health program coordinating council recommended for the Crow Reservation could also be functional as a comprehensive planning agency for health services. Under recent legislation, areawide comprehensive health planning grants from the Public Health Service can be made to either public or nonprofit private organizations if there is an assurance that the interests of local government are represented. Planning under such a grant must emphasize and encompass all the health needs of the citizens in the area. This means including physical, mental, and environmental health needs. The health program coordination council must attempt to coordinate all health services under both public and private auspices. Federal policy requires that a majority of the members of the policy-making body for the comprehensive planning be consumers and that all segments of the population be represented. This must include the poor minorities and the minorities whose health problems are the greatest but who have had little or no voice in previous health planning. Applications for a grant to assist such comprehensive health planning must be approved by the State Comprehensive Health Planning Agency and the local agency must offer assurances of cooperation with the state agency.

In order to qualify for a grant under this program, the local agency must establish its position as the organization responsible for health planning on the Crow Reservation. This will require agreement among the member agencies and non-agency members that this should be a function of the local health program coordinating council. An initial grant could be made to the council for the purpose of organizing health planning. Subsequent grants could be possible to actually carry out comprehensive planning as a portion of the health program coordinating council's total activities.

Organizational Roles and Funding Potentialities: There are a number of organizations, both in the public and private sector, which can contribute to the conduct of health programs on the Crow Reservation. A summary of these programs as presented herein details certain programs that are particularly significant to the Crow situation. No single organization can be counted on to provide all of the services required by Crow Reservation residents. Therefore, only through judicious use of all available resources can adequate health services become available in such a sparsely populated location.

There are four major types of non-governmental health related organizations which can contribute to the health programs suggested for the Crow Reservation. Particular attention is directed to the voluntary hospital organizational type to replace the current system where only Indians residents receive care. There is no comparison between a federal facility for Indians alone and an all race voluntary, or private, hospital to provide service to all residents.

Table C summarizes the general roles of non-governmental health organizations. While not all of these are applicable to the reservation, the informa-

TABLE C

THE GENERAL ROLES OF NON-GOVERNMENTAL HEALTH RELATED ORGANIZATIONS

Organization	Membership	Purposes	Activities
Medical societies	Open to almost all licensed physicians conforming to the society's code of ethics.	Safeguarding medical ethics, promoting & improving the quality of professional competence.	Publications State, regional and national conventions Local meetings Medical libraries Sponsorship of group insurance Prevention and review of liability claims Collection services Public relations Grievance committees and representation of members in community relations Health education
Voluntary health Agencies	Primarily laymen; participation by physicians either on the board or advisory committee; Health officers and other offical agency people.	Educating people concerning their own health and motivating them to take necessary action; creating favorable public opinion about community activities in specific fields; Some agencies organized to provide certain types of service rather than deal with certain health problems.	Health education Support of local research in health department, hospital or medical school Sponsor continuing education for physicians, nurses, other health workers Demonstrate new programs and techniques Temporary payment of professional salaries until other funds are available Screening for unrecognized diseases Direct services to individual; referral and information, public health nursing. purchase of drugs, transportation, volunteer clerical or aide services in hospitals and clinics. friendly visiting.

TABLE C, continued

Organization	Membership	Purposes	Activities
Hospitals			
Voluntary	Administered by trustees either appointed by the sponsoring agency or elected by self-perpetuating group of incorporators; serve without pay, represent the hospital in the community. Trustees name an administrator who increasingly is a layman with professional training in hospital administration. Members of medical staff are practicing physicians from the community who treat patients in the hospital and are appointed by the board on the basis of qualifications established by the hospital and on recommendation of existing medical staff.	Founded by church or religious order, group of citizens, or individual philanthropist. State charters permit them to solicit funds under guarantee they will not pay a profit in operating the hospital	
Proprietary	Administered by owners or persons appointed by owners; members of medical staff selected by owners; sometimes owners are members of medical staff.	Operated as business enterprise	6% of beds used for short-term general care
Coordinating Organizations	Voluntary and governmental health and welfare agencies; citizens representing community forces and the public.	To coordinate health and welfare services; to encourage cooperative community planning for health and welfare services	Programs aimed at specific community problems; provide consultation and guidance to agencies in administering their programs; information services; educational activities.

tion presented does summarize organizations and roles which may indirectly influence local affairs.

The Federal government is the dominant governmental contributor of organizational and monetary support for health programs. The Department of Health, Education and Welfare is the principal federal agency concerned with this assistance. All of the Department's constituent agencies carry on some health related activities.

The Social Security Administration, which is known for managing the old age and survivors insurance program, is also responsible for administering medicare. Over 600 district offices of the Social Security Administration provide information, accept applications for insurance benefits, and furnish assistance requested on Social Security matters.

HEW's Office of Education provides grants for education and supporting services for handicapped children. It includes information about health and safety and its analysis, studies, and reports about schools in the United States that have cooperative research funds to be used for research in school health programs such as the one recommended for the Crow Reservation.

The Social and Rehabilitation Service constituent of HEW is organized into five components: the Rehabilitation Service Administration, the Assistance Payments Administration, the Medical Services Administration, the Children's Bureau, and the Administration on Aging.

The Rehabilitation Services Administration is responsible for programs which aid the handicapped, disabled, social security applicants, the mentally retarded, the blind, and the permanently and totally disabled. Through grant-in-aid programs, the Administration supports service programs provided by vocational rehabilitation agencies at the state level and reaches over 100,000 people. Grants are available to all the states for services to both the physically and mentally disabled. Programs may include diagnostic services to determine eligibility and services needed, training, guidance, and placement, and other services including physical restoration or purchase of appliances.

In addition to supporting the continuing service programs, the Rehabilitation Services Administration also makes grants for partial support of extending or improving service programs, for research and demonstration, for the establishment of rehabilitation facilities in research and training centers, and for training of professional personnel in the rehabilitation field.

Responsibility for grants for various categories of public assistance, such as old age assistance, aid to families with dependent children, aid to the blind, and aid to the permantly and totally disabled, rests in the Assistance Payment Administration of HEW.

The 1965 amendments to the Social Security Acts greatly extended medicare programs for the needy in all categories of public assistance and the administration responsibility for such programs rests with the Medical Services Administration.

The Children's Bureau has two responsibilities under federal law. First, investigation and reports on all aspects of the welfare of children and secondly, providing technical and financial assistance to the states for child health and welfare services. In fulfilling these responsibilities, the Bureau engages in and supports research activities, compiles data on several aspects of child welfare for issuance in publications, and conducts other child welfare related activities. Grants to the states as administered by the Bureau are for maternal and child health programs, crippled children's services, and child welfare services. Essentially, all of the states partitipate in these programs. Since 1965, the Bureau has been authorized to provide project grants for comprehensive health care services for children in low-income areas.

The Administration on Aging serves as a clearing house for information, provides technical assistance to the states, and administers grants for several purposes.

Another major HEW agency which provides significant service is the Public Health Service. This agency clearly reflects the growth of national interests and concerns about health. In the past decade this Service has grown to its present position as the largest contributor of medical research in the nation and as the administrator of about $400 million in grants and aids to support state and local programs and professional training. Three components of the Public Health Servicl are the Health Services and Mental Health Administration, the National Institute of Health, and the Consumer Protection and Environmental Health Service. The administrators of all three units are directly responsible to the Assistant Secretary for Health and Scientific Affairs, whose Deputy is the Surgeon General.

The Health Services and Mental Health Administration includes programs that focus on comprehensive health planning, development of comprehensive health services, and programs for both preventative and personal care for both physical and mental health. It administers grants to the states and to local recipients for those purposes and conducts and supports research and demonstrations aimed at improving the quality of all health services and their accessibility to all segments of the population. This Administration has the responsibility for the grants for regional programs to combat heart disease, cancer, and strokes. On the basis of vital statistics that it collects and analyzes, the National Health Survey provides a means of on-going evaluation of the nation's health. This Administration also has the responsibility for personal care of the services legal officiaries, Merchant Seamen, the Coastguard, inmates of the federal prison, and American Indians. It is under this beneficiary arrangement that public health services are provided on the Crow Reservation.

An important contribution to the state and local health services is made and federal grants administered by the Health Services and Mental Health Administration. These grants have been made in two forms: first, formula grants to all the states determined according to population and economic status; second, population grants made usually to local agencies for special projects. Over the years, both types of grants have been made in specific health areas or categories. Under the Comprehensive Health Planning and Public Services amendments of 1966, expanded and extended by the Partnership for health amendments for 1967, this pattern has been altered. The law authorizes grants for five purposes: (1) formula grants to state agencies designed for the purpose of enabling the states to establish formal provisions for comprehensive state health planning to meet current and future health needs through public and private resources; (2) project grants to public or non-profit private agencies for developing comprehensive planning for coordination of health services, facilities, and manpower for regional, metropolitan, or other local areas; (3) project grants to public or non-profit private agencies for training studies and demonstrations aimed at improved or more effective comprehensive health planning; (4) formula grants to the states for establishing and maintaining adequate public health and mental health services. Use of 70% of the funds for services in local communities is required under this provision; and (5) project grants to public and non-profit private agencies to help provide services to meet health needs of limited geographic scope or regional or national significance and to stimulate new programs. These will replace most of the categorical project grants and are required to be consistent with the Comprehensive State Health Plan.

Recent legislation will enable states and local communities to receive federal assistance for their programs according to their individually determined needs rather than only for stipulated purposes. It puts upon state and local areas the responsibility of making rational plans and provides assistance for them in doing so.

Two functional units are in the National Institutes of Health. First, the Bill of Health Manpower which promotes the development of increased numbers of better trained health workers through grants for training, construction of educational facilities, and student assistance. Second, the National Library of Medicine which has the largest collection in the world of catalogued publications in the bio-medical sciences.

The National Institutes of Health make up the component of the Public Health Service that is concerned almost entirely with research. They engage in research and support research projects through grants to investigators in universities and other institutions throughout the country. Awards are also made for development of physical resources and for general programs of research related to health.

Consumer Protection and Environmental Health Service combines the National Centers for Air Pollution Control, Radiological Health, and Urban and Industrial Health, plus parts of the National Center for Communicable Disease Control and the Food and Drug Administration.

In its medical care and treatment program, the Veteran's Administration operates hospitals, out-patient facilities, and domiciliary facilities for veterans with illness or disability associated with their military service. The VA gives complete hospital care for other veterans with non-service illnesses who cannot afford to pay for it. The VA pursues research in the diagnosis and treatment of disease and has developed a number of methods for administering medical care aimed specifically at caring for all the patient's needs and preventing unnecessary hospitalization.

The Department of Defense furnishes comprehensive medical care for members of the armed forces and their dependents and engages in activities to insure environmental sanitation in military installations. The U. S. Army Corps of Engineers takes an active part in water supply and pollution control activities.

The Office of Economic Opportunity is concerned with health, both directly and indirectly, since poverty contributes to ill health and ill health to poverty. Its VISTA and Job Corps programs offer opportunities for improvement in health and the objectives of many Community Action programs include meeting health needs.

The programs of the Department of Housing and Urban Development are also pertinent to health matters. For example, the Department administers grants for basic water and sewer facilities requiring suitable safeguard against pollution of waterways. Grants to neighborhood facilities finance health and recreation projects as well as other community services.

The Federal Housing Administration, now a component of the Department of Housing and Urban Development, has long promoted the healthfulness of federally supported housing and it joins with the Public Health Service in planning for health facilities to serve residents of such housing projects.

A number of programs of the U. S. Department of Agriculture are related to human health. Programs to eradicate tuberculosis and other diseases in animals protect the human population, as do meat inspection activities that insure the purity of food. The Department's long established program for improving human nutrition has played an important part in reducing the incidence of nutritional deficiency diseases in this country. The work of its County Extension and Home Demonstration agencies has promoted rural health and sanitary measures for many years. This is a program which could be of increasing importance to the Crow Reservation.

In the U. S. Department of Interior, the Environmental Protection Agency makes grants to communities for improved sewage treatment and carries out procedures to enforce federal water pollution laws.

The Bureau of Mines conducts studies and demonstrations on preventing accidents and protecting the health of miners and the Fish and Wildlife Service promotes programs for the control of certain animals that carry disease.

Federal agencies have many provisions for coordinations of their activities with those of other federal agencies. This coordination comes through both inter-departmental committees and through less formal arrangements. The Bureau of the Budget also acts to prevent duplication and to encourage cooperation of agencies conducting similar programs.

At the state level, government also contributes a considerable input into the total local health system. The State Health Department has the broadest scope of health activities of any state agency. Policy for the Department is determined in most states by a Board of Health whose members are appointed by the governor. The duties of the State Board of Health, in addition to policy determination, include promulgating rules and regulations, drafting or revising public health codes, and executive and enforcement functions. The State Health Officer, in addition to his function as chief executive of the State Health Department, acts for the Board of Health when it is not in session and has authority to put into effect and enforce its rules and regulations. He has responsibility for management of funds appropriated to the Department and is the chief advisor to the State's elected officials on health matters. The functions of the State Health Department include four basic activities: (1) leadership; (2) financial assistance to local health agencies; (3) setting and enforcing health standards; and (5) providing certain health services. To assume its leadership roles, the Health Department continually assesses the state's health conditions in the quality and adequacy of the health service. On the basis of such assessments, statewide health programs are planned and promoted. The Department must work with other executive departments in the state and must often negotiate with other states and with the federal government in the interests of health. Local health interests should be able to look at the State Health Department's leadership to determine the need for new state legislation and to be able to initiate it, to propose and support programs in emerging areas of need or public demand, to provide consultation and guidance for local programs, to provide, on occasion, professional assistance, and to enable and encourage regional planning and operations where they are necessary.

Financial aid is given, in most states, either to the state as it should be in Montana or to the local governments for public health purposes. Aid often requires local matching funds. Although ideally funding should be available for any suitable program, it is often available for only certain specific purposes. The State Health Department also administers federal funds granted to the state and reviews federal grant applications made directly by local agencies.

The State Health Department has the legal responsibility for administering public health laws, the sanitary codes, some licensing requirements, and other health regulations. Some enforcement duties are delegated to the local level by the State Health Department.

Health services provided directly by the State Health Department include six general program areas; personal health services, research, environmental health services, public health education, professional education, in-service training, and administrative services. The staff of the State Health Department comprises many of the health professions, dentists, engineers, physicians, sanitarians, social workers, statistcians, veterinarians, as well as people concerned with administration and management. Considering its scope, the State Health Department could be of tremendous assistance to the local area.

Present day expectations about health services go beyond what is provided through government programs. However, governmental leadership on the Crow Reservation is necessary for success of the local health programs. Without their support and cooperation, any community health program would fail.

ALPHABETICAL LIST OF AVAILABLE FEDERAL ASSISTANCE PROGRAMS - BY AGENCIES:

U. S. DEPARTMENT OF AGRICULTURE:

- Commodity Distribution Program
- Cooperative Extension Service
- Economic Reserach Service
- Farm Ownership Loans
- Food Stamp Program
- Loans for Recreational Purposes
- Loans to Rural Families with Small Incomes
- Rental Housing .
- Special Milk Program for Children

U. S. DEPARTMENT OF COMMERCE:

- Grants and Loans for Public Works and Development Facilities
- Public Works and Economic Development
- State Technical Services Program
- Trade Adjustment Assistance

U. S. DEPARTMENT OF DEFENSE:

- Community Economic Adjustment Program
- Health Benefits for Uniformed Military Servicemen and Dependents
- Machine Tool Loans to Vocational Schools
- Water Quality Control

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE:

- Adult Basic Education
- Aid to Families with Dependent Children

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, continued:

Aid to the Permanently and Totally Disabled
Air Pollution Control
Areawide Comprehensive Health Planning Programs
Child Welfare Research, Training, and Demonstration Projects
Child Welfare Services
Chronic Diseases and Health Problems of the Aged.
College Work-Study Grants
College Work-Study Program
Community Health Services for Chronically Ill and Aged
Community Immunization Program
Community Service and Continuing Education Program
Comprehensive Planning for Vocational Rehabilitation Services
Comprehensive Public Health Services
Consumer Education
Consumer Health Protection
Cooperative Research Program
Correctional Rehabilitation Study Program
Demonstration Projects in Public Assistance
Dental Health Program in Communities
Development and Expansion of Community Mental Health Programs
Drug Abuse Control
Educational Opportunity Grants
Environmental Sanitation
Faculty Development Programs in Educational Media
Federal Credit Unions - Loans and Thrift and Financial Counseling
Full Utilization of Educational Talent
Grants for Public Health Practice and Research
Handicapped Children and Youth Research and Demonstration
Health Insurance for People 65 or Over (Medicare)
Health Services and Facilities for American Indians
Health Service Development Projects
Hospital and Medical Facilities Construction
Improving Education of Educationally Deprived Children
Injury Control
Institutes for Teachers of Disadvantaged Youth

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, continued:

- Juvenile Delinquency and Youth Offenses Prevention and Control
- Loans to Students in Institutions of Higher Learning
- Maternal and Child Health Services
- Medical Assistance Program
- Medical Assistance to the Aged - Kerr-Mills Program
- Mental Health Centers in Communities
- Mental Retardation
- Nurse Training
- Occupational Health
- Old-Age Assistance
- Project Support for Handicapped Individuals
- Projects for Health Care and Services for School and Preschool Children
- Public Health Training for American Indians
- Regional Medical Program
- Research and Demonstration Projects in Social Welfare
- Research Fellowships and Traineeships in Health Sciences
- Sanitation Facilities for American Indians
- Science Youth Activities
- Services for Older Americans
- Solid Waste Program
- State Programs in Guidance, Counseling, and Testing
- Training of Professional Personnel in the Education of the Handicapped
- Treatment of Narcotic Addicts
- Tuberculosis Special Project Grants
- Vocational Education Grants
- Vocational Rehabilitation Research and Demonstration Grant Program
- Vocational Rehabilitation Services
- Work Experience Program

U. S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT:

- Advances for Public Works Planning
- American Indians - Public Housing Program
- Code Enforcement
- Community Development Training and Research Grants
- Demolition of Unsound Structures

U. S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, CONTINUED:

- Low-Income Housing Demonstration Grants
- Mortgage Insurance for Housing for Families of Low and Moderate Incomes
- Neighborhood Facilities
- Rent Supplements for Disadvantaged Persons
- Water and Sewer Facilities Grant

U. S. DEPARTMENT OF THE INTERIOR:

- American Indian Credit and Financing Program
- American Indian Education Financial Assistance
- American Indian Industrial Development Program
- American Indians - Adult Vocational Training
- American Indians - Construction of Reservation Roads and Bridges
- American Indians - Direct Employment Assistance
- American Indians - Federal Schools
- American Indians - Financial Assistance to School Districts
- American Indians - General Assistance and Social Services
- American Indians - Identification of Mentally Retarded Children
- American Indians - On-Reservation Adult Education Program
- American Indians - Post High School Training for Youths
- American Indians - Scholarship Aid for Students in Higher Education
- American Indians - Social Services to Children
- American Indians - Summer Programs for Students

U. S. DEPARTMENT OF JUSTICE:

- Community Relations Service
- Law Enforcement Assistance

U. S. DEPARTMENT OF LABOR:

- Apprenticeship and Training
- Community Employment Program
- Job Market Information
- Manpower Development and Training
- Manpower Research Programs
- Neighborhood Youth Corps
- New Careers Program
- Operation Mainstream

U. S. DEPARTMENT OF LABOR, CONTINUED:

Physically and Mentally Handicapped - Employment Service
Unemployment Insurance
U. S. Employment Services
Youth Opportunity Centers

U. S. DEPARTMENT OF TRANSPORTATION:

National Highway Safety Programs

U. S. DEPARTMENT OF THE TREASURY:

Assistance in Law Enforcement
Narcotics Law Enforcement Training

CIVIL SERVICE COMMISSION:

Opportunities for Federal Civil Service Employment
Stay-in-School Campaign - Youth Employment

OFFICE OF ECONOMIC OPPORTUNITY:

Assistance for Migrant and Seasonal Farm Workers
Community Action Programs
Head Start
Job Corps
Legal Services
Neighborhood Health Centers
VISTA

GOVERNMENTAL ORGANIZATION

The Crow Tribe of Indians of Montana is a recognized, unorganized tribe. By popular vote the members rejected the Wheeler-Howard Act and did not utilize standard governmental procedures until June 24, 1948 when they adopted a written constitution by a vote of 130 against and 295 for acceptance. Under their constitution a general council form of government prevails under which every adult enrolled member has a vote at the council meetings that are held at least quarterly. A quorum of 100 qualified voters must be present to allow the council to conduct tribal business.

The reservation is politically subdivided into six districts the boundaries of which are, for the most part, drawn on township lines. The districts are: Agency or Reno District (Crow Agency); Lodge Grass District (Lodge Grass); Wyola District (Wyola); Pryor District (Pryor); Big Horn District (St. Xavier); and the Black Lodge District located in the Hardin ceded lands. All districts except Black Lodge are entirely within the reservation bounday. The tribal districts are not based upon population but general geographic areas.

All transactions of tribal business, including the election of tribal officers, are conducted at the general councils. An Executive Committee, composed of two elected members from each of the tribal districts has the responsibility of establishing the agenda for each council. In addition to the Executive Committee, several others are elected on the district level and some are appointive. Committees on credit, education, enrollment, health and welfare, industrial development, oil and gas, land purchase, recreation and tourism, ranch purchase, housing, law and order, and an advisory commission are all active within the tribal structure. In addition, an utilities commission has been provided for but has not been activated.

Tribal officers are elected every two years on the second Saturday in May, as provided for in the constitution and by-laws of the tribe. The last election in May, 1970 saw Edison Real Bird re-elected for an unprecidented third term as tribal chairman. He is the first college graduate to be elected to the office and at the time of election to his first term, was the youngest chairman to serve the tribe. Other officers of the current slate include John Hill, Sr., vice chairman; Fredrick Left Hand, secretary; and Sharon Old Elk, vice secretary. With the exception of the vice-chairman, all of the tribal officers are under forty years of age. It is assumed that the shift of power away from the tribal elders in the leadership positions will continue in the future. Within the past ten year period, the younger members and the women have begun to take a more active part in tribal and community affairs. Just five years ago the tribe selected the first woman in tribal history to an elective tribal office.

Politics on the Crow Reservation are deeply ingrained into the way of life although no political parties or party system familiar to most Americans is present. As allegiances between family clans change, so changes the political fortunes of the issues or candidates under consideration. Similar to other important tribal business, the officers are elected by secret ballot and each must take his place before the electorate on his own merits. A show of hands, or a voice vote is utilized to determine agenda items of lesser importance, the method of vote being at the discretion of the voting members on the floor during the general council meetings.

Polls located in each of the tribal districts are utilized for election of members to the executive committee as well as the land, credit, and livestock committees. Under the present constitution, voting is limited to tribal members over 21 years of age. The tribe has not, as yet, taken the lead of the U. S. Congress in lowering the voting age to 18. If this action were to be taken, the 2,224 members eligible to vote would increase to about 2,400.

Although tribal elections are held about six months previous to the traditional date for federal and state elections, the voting turnout of registered tribal members is somewhat better than average. In recent years, an average of nearly 72 percent has made their voice known at the pools. During the 1968 Presidential election almost 85 percent of the 1,500 eligible Crows turned out to exercise this right. According to the consultant's survey, the reasons given the most often for failure to vote--in order of number of responses were: 1. Non-registration, 2. Lack of interest in issues or candidates, 3. Lack of transportation to polls, 4. Sickness and disabilities, and 5. Inability to write or speak English. Each of the districts on the reservation has at least one regualr polling place.

The governmental system of the Crow Tribe has undergone a wide variety of investigations and subsequent recommendations for improvement, usually from federal government levels, during the past twenty-plus years. For the most part the recommendations have taken the form, "It will be necessary for the Crow Tribe to amend their constitution to enable a more democratic form of government and to provide for the election of delegates by popular vote of the people on a secret ballot."

While it is agreed that the tribal government, similar to ALL governments, could stand some change it does not necessarily mean that the present system must be thrown out and a new political structure enacted. In its present form the Crow Tribe has a more "democratic" form of governing themselves than the United States as a whole or any of its component states. A pure democracy is one in which the people constitute the ultimate power of decision. Under the present system, the tribal membership, of legal voting age, all have an equal voice in the reservation government--a totally representative system.

Perhaps at times their system is unwieldy--but only because of the magnitude of the governing body. Why is it necessary for them to "change" the entire system because of an obstacle? Certainly it is not one that cannot be overcome without a major re-structuring effort.

The Crow people themselves recognize that some change is necessary. Over 85 percent of them indicated this fact in the consultant's survey. But by the same token, a similar percentage indicates that the present form of government is preferable. They should be allowed to have it. There is no good reason that they should elect a business council or representative body and establish a bureaucratic administration that increasingly places greater and greater demand upon the electorate.

As the Crow Tribe assumes more and more responsibility for the management of its affiars and the provision of "services" to the public, it is only natural that the government must be modified to enable an efficient administration of affairs. In essence, this means that the individual agencies or commissions or other bodies must have some latitude in the decisions which will affect their day to day discharge of duties. It is not necessary for them to have uncontrolled powers or to act without any effective means to reserve a decision by veto or other legislative act. But by the same token, they should be able to act within their delegated powers on the day to day business without waiting for up to three months for a relatively minor decision.

One of the major handicaps the Crow Tribe has at present is an apparent lack of control over tribal financial matters. During the past ten years, the inability on the part of the tribe to invest their assets in banks or securities where the highest interest rate was paid has cost the tribe nearly $1,000,000. In addition, the practice of using U. S. Treasury checks to make allotment payments, tribal payrolls, and other administrative functions has affected the image of the Crow Tribe as a whole and the individual members. The comment that "the Indians are getting a monthly paycheck from the government," is commonly heard throughout the area. In truth the "paychecks" are either payment for services rendered in the employ of the tribe, or monies due the individual allottees from leases in effect on their lands, or "per capita" payments from judgment funds, land sales, etc.

The annual operating budget should be transferred to the Crow Tribe and all paychecks and lease payments made on tribal checks. There are several accounting procedures that may be utilized to insure that all disbursements are proper and of the right amount. One of the first the tribe should initiate is a system of purchase orders or other authorization prior to expenditure of funds. The purchase orders should relate to specific budget line items, and the line item checked for availability of funds prior to the order receiving authorization. All receipts and expenditures should be maintained in regularly audited books with the accounting office issuing monthly or semi-monthly operational statements to the administrative offices and the tribal officers.

Each of the tribal commissions should be required to submit a detailed budget request to the tribal council on an annual basis. The budget requests, in their submitted or amended form, together with the administrative funds would become the total annual tribal budget. The Tribal Council should retain its budgetary powers and thus retain control of all tribal affairs.

Descriptions of the powers and authority and scope of performance of each of the tribal commissions and tribal employees should be established in written form.

In other areas of government the Crow Tribe has made substantial progress within the past 25 years. The council in 1946 accepted the laws of the State of Montana as they apply to marriage and divorce. In 1947 they acted to adopt State laws regarding public health and attendance in schools. They passed a resolution establishing qualifications for tribal membership in the early 1950's. This action was viewed by the federal government as "a definite step toward assimilation of the Crow people." The reverse has occurred. Rather than the blood relationship of the tribal members slowly decreasing until membership is no longer possible, the roles of qualified members has increased by nearly 150 percent in the intervening years. The current trends indicate that this increase will continue throughout the planning period.

Several indicators of the feeling of the Crow people as a whole was obtained from the consultant's survey. While a substantial number felt that the relationship that currently exists between the federal government as trustee and the tribe should cease at some time in the future, most were reluctant to state whether this should occur in five years, ten years, fifteen years, or twenty years. This feeling is in accord with the numerous statements of tribal members in leadership positions. Most are aware that the trusteeship will end at some time but reluctance to accept this is evident. This is a psychological obstacle not unique to the Crow Tribe but one that is prevalent among Indians throughout the nation.

In the case of the Crow Tribe and the Crow people, each year new fields of business, industry, and government are entered. Recent years have seen introduction of the Mohasco carpet mill, construction of a motel, heritage park, and ceremonial viewing stand, community buildings, youth camp, and many other projects. Under consideration are extensive developments on the Big Horn Canyon, purchase of the Campbell Ranch, and development of coal resources. As these and other areas are expanded so will the responsibilities of the Crow Tribal government to the people. Each new venture will require additional personnel for administration, management, and expanded utilities and services. All are healthy attributes of a growing government.

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OFFICES THROUGHOUT THE WORLD

June 17, 1971

Enclosed please find three copies of our preliminary research on the CROW Management & Organization Study which is part of the "701" Plan.

We hope that the above meets the immediate requirements and can assure you that additional research, not reflected in the above, gives promise of fruitful development of a responsive and viable management structure adaptable to the needs of the CROW Tribe.

Sincerely yours,

LAVENTHOL KREKSTEIN HORWATH & HORWATH

Michael Sandler

Michael Sandler

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Enclosures

GOVERNMENTAL ORGANIZATION AND STRUCTURE

The Crow Tribal Government, rooted in the Indian Reorganization Act of 1934, represents a condition of limited autonomy within the framework of its constitution and United States laws administered by the Bureau of Indian Affairs (BIA). The existence of the constitution establishes a legal status for the Crow Tribe, and provides for certain powers, and functions thereof, which can be exercised according to that base of legality. All other powers are assumed to lie with the BIA and its Agency Superintendent. The types of powers that the Tribal Council can exercise on the reservation generally include the following:

- negotiations with Federal, State, and local governments;
- employment of staff, attorneys, and consultants;
- regulation of land use;
- recommendations of tribal appropriations;
- management of tribal economic affairs;
- levy of taxes and fees;
- appropriation of tribal funds;
- determination of tribal membership;
- regulation of law and order;
- powers of eminent domain;
- chartering and regulation of subordinate organizations;
- regulation of members' welfare;
- regulation of tribal elections;
- engaging in any business;
- borrowing money.

At present, the powers, as translated into functions, are carried out by the Tribal Council, composed of all tribal members, through its elected officers and its Executive Committee, both elected. From the tribal point of view, the primary goal of government is to maximize the Crow Welfare through the best possible development strategies, internal management of authorized affairs, and preparation for relations with the BIA. In order to effectuate a closer approximation of achievement of this goal, the organizational scheme outlined below is offered as an alternative model to the present system.

Essentially, the Crow Tribe functions as a corporate entity, but at the same time is in the public sector as the recognized legal unit for a designated body of citizens. As such, the tribe differs only in complexity from a typical chartered city, which exercises certain specifically defined powers at the pleasure of, and in lieu of, the state. Many cities, however, are not managed efficiently and effectively, for many reasons. As a consequence, many different formulas have evolved or been developed, attempting to provide the best combination of effective, efficient, and responsive government for local needs.

One design that recognizes the analogy between the public government corporation and the private business corporation is the council-manager plan, under which well over 40 million Americans are governed locally. The council-manager plan according to the International City Management Association, represents a

> far-reaching attempt to solve the apparent conflict between democracy and efficiency. Democracy is preserved in the popular election of a small council, on a short ballot which does not overtax the attention which citizens usually bestow on government. Efficiency is achievable by the employment of a manager professionally trained for the technical job of administration. The danger of bureaucracy irresponsible and unresponsive to the will of the community is met by giving the council complete control of the manager's tenure of office.

Overall, the experience of sixty years of the council-manager plan has been favorable, especially significant in bringing honesty, impartiality, and efficiency to the governments in which it has been adopted. Its weaknesses have lain in responsiveness--the council and manager have tended to govern with disregard, be it flagrant or subtle, for the so-called popular will. Nevertheless, the plan has demonstrated an ability to mobilize resources for development, as well as to adapt to changing economic, political, and social conditions. As such, the council-manager plan, at least in a modified form, meets the theoretical criteria for a Crow Tribal government.

Under the plan, the Tribal Council, analogous to the New England town meeting, becomes the constituency, and can continue to meet regularly quarter-annually. The Tribal Council retains all final authority and responsibility for the areas and powers delegated to it under the constitution. Likewise, the Executive Committee would continue to be elected as now, and to exercise on-going authority and responsibility in the stead of the Council. The Executive Committee then appoints the professional manager to carry out certain functions of government, responsible both to the Executive Committee and to the plenary Tribal Council. Policies are determined by the Committee and Council and administration of those policies is vested in the manager.

The actual duties of the manager could be summarized as follows: (1) to enforce laws and ordinances; (2) to appoint, supervise, and remove employees (including attorneys and consultants); (3) to make recommendations to the Committee and Council as seem to him desirable; (4) to advise the Committee and Council on the Tribe's financial condition and needs; (5) to prepare an annual budget; (6) to prepare reports and strategies as directed or as needed to carry out policy; and (7) to keep the Tribal members informed.

The council-manager plan is particularly well-suited to the type of developmental objectives which the Crow Tribe now embrace. Examples of these objectives include: raising the standard of family income to a level comparable with the average for the surrounding community and attaining an education level equal to that of the national rural non-farm population. The council-manager form of government has traditionally been associated with high levels of planning and programming for development. This quality is largely due to the manager's professional understanding of governmental tools and information, as well as his ability to deal with other professionals who plan and budget.

More specifically, the Crow Tribal Advisory Commission needs a professional to whom it can turn for administration of developmental plans it is currently devising, with outside assistance. If and when the plans are approved by the Tribal Council, professional management will be invaluable in implementing the various land use, economic, and human resources strategies. Much of the wherewithall for such implementation will derive from the outside, including federal grants and loans, state aid, and private technical assistance, all carried out under close supervision of the BIA. The manager can draw together the diverse elements of the development, which cannot be accomplished by Crow lay members, by outside consultants, or by BIA personnel, and provide for the establishment of the permanent mechanisms of administration for such innovations as zoning, housing codes, and employment and training programs.

In conclusion, it can be stated that a need exists for a professional manager to administer Crow governmental affairs for the Tribal Council, especially in the context of concentrated developmental planning and implementation. But is there enough work in a small tribe to keep a manager fully occupied? The experience of small cities of equivalent population is that there is more to do than the manager has time for. Generally, smaller size permits the manager to supervise each activity more closely, and thus more effectively than in larger policies. Small size also places the manager in a special administrative position close to the Tribal members, thus providing a useful ombudsman function.

But, can the meager resources of the Crow Tribe enable it to support a professional administrator? This is a valid question, and one which can only be answered relatively. Small towns are likewise poorly financed and usually obtain only the quality of manager that the resources can command. However, it can be argued that a less experienced or average administrator to manage Tribal affairs is an acceptable improvement at a critical stage for the Tribe. Naturally the manager plan cannot be effective unless funded. The level of that funding will probably determine the credentials of the manager, but certainly not the success or failure of the plan.

We are proposing that the above described council-manager plan be presented to the Crow Tribal Council as one of a set of strategies to promote the developmental goals of the Tribe and to institute greater efficiency and effectiveness in the management of Tribal affairs. The plan is flexible and can be fitted to many different sets of conditions relating to the economic, social, and political

EXIGENCIES AT ANY TIME. THE COUNCIL-MANAGER PLAN IS TO PROVIDE A FRAMEWORK IN WHICH OTHER STRATEGIES FOR DEVELOPMENT CAN FIT. IT IS IN THIS LIGHT THAT THE SCHEME CAN BE PRESENTED TO THE TRIBAL COUNCIL FOR ITS ACTION.

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harrison g. fagg & associates **crow tribal advisory commission**